1898

General Catalogue 1898

Utah State University

State Agricultural College of Utah.

1898-99.

MAIN COLLEGE BUILDING.

COMPLETE EXCEPTING THE CENTRAL FRONT.

ANNUAL CATALOGUE

OF THE

AGRICULTURAL COLLEGE

OF UTAH

FOR THE YEAR 1898-9.

LOGAN, UTAH.

TRIBUNE JOB PRINTING CO., SALT LAKE

CALENDAR, 1898-1899.

1898.

January.

S	M	T	W	T	F	S
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1899.

January.

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February.

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March.

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April.

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May.

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June.

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July.

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August.

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September.

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October.

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November.

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December.

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COLLEGE CALENDAR, 1898-9.

FIRST TERM begins Tuesday, September 20, and ends Friday, December 23, 1898.

SECOND TERM begins Wednesday, January 4, 1899, and ends Thursday, April 6.

THIRD TERM begins Tuesday, April 11, and ends Tuesday, June 13, 1899.

Commencement Exercises occur from Sunday, June 11, to Tuesday, June 13, 1899.

HOLIDAYS.

Thanksgiving Day.
Christmas vacation, December 24, to January 3.
Washington's Birthday, February 22.
Arbor Day, April 14.
Decoration Day, May 30.
Summer vacation begins June 14.

BOARD OF TRUSTEES.

HON. WILLIAM S. McCORNICK, President . . . . Salt Lake City
HON. EMILY S. RICHARDS . . . . . Salt Lake City
HON. MARRINER W. MERRILL . . . . . Richmond
HON. D. C. ADAMS . . . . . Salt Lake City
HON. LORENZO HANSEN . . . . . Wellsville
HON. JOSEPH MORRELL . . . . . Logan
HON. ROSINA N. BAGLEY . . . . . Ogden

OFFICERS OF THE BOARD.

WILLIAM S. McCORNICK, President . . . . . Salt Lake City
JOSEPH E. WILSON, Secretary . . . . . Logan
ALLAN M. FLEMING, Treasurer . . . . . Logan

EXPERIMENT STATION STAFF.

JOSEPH M. TANNER . . . . . President of the College
LUTHER FOSTER . . . . . Director and Agriculturist
GEORGE L. SWENDSEN . . . . . Hydraulic Engineer
F. B. LINFIELD . . . . . Dairy Husbandry
JOHN A. WIDTSOE* . . . . . Chemist
U. P. HEDRICK . . . . . Horticulturist
JAMES DRYDEN . . . . . Meteorologist and Poultry Manager
LEWIS A. MERRILL . . . . . Assistant Agriculturist
JOHN A. CROCKETT . . . . . Assistant Dairyman
JOHN STEWART . . . . . First Assistant Chemist
JAMES C. THOMAS . . . . . Second Assistant Chemist
ALLAN M. FLEMING . . . . . Treasurer
JOSEPH E. WILSON . . . . . Secretary

*Absent in Germany on leave.

FACULTY.

Arranged in order of seniority of appointment, after the President.

JOSEPH M. TANNER, PRESIDENT,
Professor of Political Science.

JOHN T. CAINE, JR., B. S.,
Principal of Preparatory Department.

JAMES DRYDEN,
Assistant Professor of Meteorology and Stenography.

ELIAS J. MAC EWAN, M. A.,
Professor of English Language and Literature.

F. B. LINFIELD, B. S. A.,
Professor of Dairying and Animal Husbandry.

WILLARD S. LANGTON, B. S.,
Assistant Professor of Mathematics and Biology.

JOHN A. WIDTSOE, B. S.,
Professor of Chemistry and Mineralogy.
(On leave of absence.)

MRS. DALINDA COTEY, B. S.,
Professor of Domestic Arts.

MISS SARAH E. BOWEN,
Instructor in Sewing, Dressmaking and Millinery.

JOSEPH JENSON,
Professor of Mechanical Engineering,
and Director of Work Shops.

MRS. SARA GODWIN GOODWIN,
Librarian and Instructor in Music.

LUTHER FOSTER, B. S., M. S. A.,
Professor of Agriculture and Director of Experiment Station.

LEWIS A. MERRILL, B. S.,
Assistant Professor of Agriculture.

EDWARD W. ROBINSON,
Assistant Professor of German, and Drawing.

SAMUEL W. DUNNING,
First Lieutenant 16th Infantry, U. S. A.,
Professor of Military Science and Tactics.

JOHN W. FARIS,
Principal of the Commercial Department and Professor of Commercial Economics and Bookkeeping.

Instructor in Elocution and Physical Culture.

JOSEPH E. WILSON,
Instructor in Penmanship.

ULYSSES P. HEDRICK, B. S.,
Professor of Botany, Horticulture and Entomology.

GEORGE L. SWENDSEN, C. E.,
Professor of Civil Engineering.

CLARENCE E. SNOW, B. S.,
Professor of Mathematics and Physics.

GEORGE THOMAS, B. A.,
Professor of History and Instructor in Chemistry.

AUGUST J. HANSON,
Foreman of Wood Working Department.

JULIEN P. GRIFFIN,
Foreman of Iron Working Department.

JOHN STEWART, B. S.,
Assistant in Chemical Laboratory of Experiment Station.

JAMES C. THOMAS,
Assistant in Chemical Laboratory of Experiment Station.

JOHN A. CROCKETT,
Assistant in Dairy Department.

ESTABLISHMENT OF THE COLLEGE.

An Act of Congress, approved July 2, 1862, provided that public lands should be granted to the several states, to the amount of "thirty thousand acres for each senator and representative in Congress," for the establishment and maintenance of an agricultural college in each state. By the terms of a recent act providing for the admission of Utah as a state, the amount of public lands granted to the Agricultural College of Utah was increased to 200,000 acres.

The national law provides that from the sale of this land there shall be established a perpetual fund "the interest of which shall be inviolably appropriated, by each state which may take and claim the benefit of this act, to the endowment, support and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." The act forbids the use of any portion of the aforesaid fund, or of the interest thereon, for the purchase, erection, or maintenance of any building or buildings.

This land became available upon the admission of the Territory to Statehood.

The legislature of Utah in 1888, accepted the provisions of the national law by the passage of an act which founded the College, defined its policy, prescribed its work, and indicated its sphere :—

"SEC. 12.—The course of instruction shall embrace the English language and literature, mathematics, civil engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed, technology, political, rural and household economy, horticulture, moral philosophy, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field."

"SEC. 10.—In the appointment of professors, instructors, and other officers and assistants of said College, and in prescribing the studies and exercises thereof, no partiality or preference shall be shown by the trustees to one sect or religious denomination over another; nor shall anything sectarian be taught therein; and persons engaged in the conducting, governing, managing or controlling said College and its studies and exercises in all its parts, shall faithfully and impartially carry out the provisions of this Act for the common good, irrespective of sects or parties, political or religious."

It is clear that the Agricultural College was founded in the interest of the industrial classes in the several pursuits and professions of life, to give not alone a technical education, but, in the language of the law, a "liberal and practical education." The legislative founders of this institution sought to place within reach of the producing classes, an education for which the older institutions had not, as a rule, made provisions.

The policy of the College is in consonance with the letter and the spirit of the laws upon which it was founded. Its courses of instruction represent the great vocations of the people of Utah: agriculture, the mechanic arts, commerce and home work.

"The act of 1862," says Senator Morrill, "proposed a broad education by colleges, not limited to a superficial and dwarfed training, such as might be had in an industrial school, nor a mere manual training, such as might be supplied by a foreman of a workshop, or by a foreman of an experimental farm. If any would have only a school with equal scraps of labor and of instruction, or something

other than a college, they would not obey the national law."

Under an act of Congress, approved March 2, 1887, the College receives $15,000 annually for the maintenance of its experimental work in agriculture. This is in charge of the department known as the Agricultural Experiment Station.

Under an act of Congress, approved August 30, 1890, the College received for its more complete endowment and maintenance "the sum of fifteen thousand dollars for the year ending June thirtieth, eighteen hundred and ninety." The act provides that this amount shall be increased by one thousand dollars each year until the annual appropriation reaches twenty-five thousand dollars. The amount received under this law for the present year will be $24,000.

The legislature of 1888 gave $25,000 for buildings. The county of Cache and the town of Logan gave one hundred acres of land on which to locate the College. The legislature of 1890 appropriated $48,000 for apparatus, for the employment of teachers, and for the construction of a house, barn, two laborers' cottages, and an experiment station building. The legislature of 1892 gave $108,000 for an addition to the College building, two houses, apparatus, and salaries of teachers. The legislature of 1894 appropriated $15,000 for the purchase of apparatus, for a greenhouse, a veterinary laboratory, and the employment of teachers. The legislature of 1896 appropriated $12,000 for the construction of workshops, and general expenses for one year. The legislature of 1897 gave $41,000 for the erection of a laboratory, the extension of shops, the maintenance of a manual training school, and for the general expenses during two and a half years.

The value of the College property now in possession may be put at the conservative figure of $238,700.

The Constitution recently framed by the Territorial Convention, for the new State of Utah, provides:

"SEC. 4.—The location and establishment by existing laws of the University of Utah and the Agricultural College are hereby confirmed, and all the rights and immunities,

franchises, and endowments heretofore granted or conferred, are hereby perpetuated unto said University and College respectively."

LOCATION.

The College is located on a broad hill overlooking the town, one mile east of Main Street, Logan, and commands a view of the entire valley and of its surrounding mountain ranges. The beauty of the location is unsurpassed, and perhaps unequalled by that of any other college in the country. A few hundred yards to the south is the Logan River, with its clear water and luxuriant grasses and shrubs. A mile to the east is a magnificent mountain range and a picturesque canyon. In other directions the towns and farms covering the green surface of Cache Valley, and seen through the clear atmosphere, constitute a delightful and impressive panorama. The city is noted for its freedom from vice; it is quiet, orderly, clean, and generally attractive, with neat homes, fine public buildings, and electric lights and water system; the citizens are thrifty and progressive. The city has a population of about 6,000, and is the capital and commercial centre of an agricultural county with more than three times that population, known as Cache Valley. The valley is a fertile, slightly uneven plain, 4,500 feet above sea level, about twelve by sixty miles in dimensions, almost entirely under cultivation, completely surrounded by the Wasatch Mountains, and one of the most beautiful and healthful valleys in the western region.

EQUIPMENT.

THE MAIN BUILDING is one of the finest in the West, being a large handsome brick structure, about 360 feet long and nearly 200 feet deep in the central part. It is complete as shown in the frontispiece, excepting the central front.

The basement contains:

The dairy rooms, equipped with the best apparatus for

the manufacture of butter and cheese on scientific principles;

The laundry, kitchen and dining rooms, which are efficiently fitted with the requisite apparatus in each division;

Several rooms adapted for military squad drill; an assaying room, and the laboratory of the civil engineering department.

On the first floor are situated:

A large auditorium, with seating capacity for 1,500 people, which is used for college entertainments, and for assemblies of the students and their friends;

A similar auditorium, capable of seating 400, used daily as a chapel, and for the weekly meetings of the College literary society;

The library and reading room, of which full details will be found on a following page;

The offices of President, Secretary, Professor of Domestic Arts, the sewing and millinery rooms, and several large class rooms.

On the second floor are found:

The biological, botanical, and entomological laboratories and lecture rooms, very efficiently equipped with the most modern apparatus for experiment and research in the respective sciences;

The offices and class room of the commercial department, which are well equipped with all the appliances for banking, commercial and general business;

Class rooms for English, mathematics, and modern languages.

On the third floor are:

The gymnasium and the museum, large rooms as fully equipped as the means at the disposal of the Board of Trustees have hitherto rendered possible, the gymnasium being also used as a drill hall for young women, and for social gatherings of the faculty and students;

The museum, which has a large unused capacity, and which it is hoped donations in any of the arts and manufactures or in geological, ethnological, mineralogical, zoological and other divisions of science, from the citizens of

Utah, or from other friends of education will gradually fill;

The music rooms, which are supplied with superior instruments.

The main building is heated by steam and lighted by electricity in every part. The rooms are light and pleasant and the halls spacious, extending on each floor the entire length of the building.

THE NEW SHOP BUILDING, situated a little south of the main building, is one story high, except the central part, which is two stories. The ground floor of this central part is fitted up to accommodate forty-eight students in carpentry. To the east of the carpentry room is the forge room, containing twenty-four power blast forges and anvils with complete equipment of vice benches and tools; in an offset to the north is the power room, containing one five-horse power electric motor and fan for the forge blast, and one ten-horse power motor and exhaust fan, which draws all smoke from the forges into underground pipes and thence through the exhaust fan to the smoke stack.

Immediately south of the carpentry room is a room used for the wood-working machinery, consisting of ten turning lathes, one planer, one hand saw, one universal saw table, one jig saw, grindstones, etc. Adjoining this on the south, is the iron-working machinery room. Its equipment consists of lathes, planer, drill press and milling machine. This room also contains the tool room and a fifteen-horse power electric motor, from which power is derived for all the machinery both in this room and in the wood-working machinery room. The second floor of the central part of the building is divided into three rooms, a class room for physics and mechanics, the director's office, and a department room well fitted with special drawing instruments and blue-printing apparatus. It also contains the annual class exhibit of students' work in mechanic arts.

The two rooms to the north of the central part, which are exactly similar to those south, are temporarily used as the students' chemical laboratory, and the experiment station chemical laboratory. The walls of the building are of brick

and the roof of corrugated irom; it is steam heated and well lighted and ventilated throughout.

THE EXPERIMENT STATION building is a large brick structure, containing the laboratories of the Agriculturist, Entomologist, and Horticulturist; the office of the Director of the Station, and the library of the Professor of English. Advanced students participate in the work of the various laboratories, and a series of experimental research is carried on in each division by the professor in charge.

A MODEL BARN AND STOCKYARD are connected with the College. The barn is a wooden building about sixty feet square and contains a silo, a root cellar, an engine room and separate quarters for horses, cattle, sheep and swine; also model storage divisions for hay, grain and farming and horticultural implements.

THE DORMITORY for young women contains accommodation for about seveuty-five lady students. Each room is about 12x14 feet, exclusive of a good closet, and is furnished with chairs, tables, a wash-stand, a full set of chamber ware, a looking glass, and either a bedstead or two cots; there are also registers for efficient ventilation. In addition to the rooms for the students, there are rooms for matron and for cooks and domestics, a model kitchen, a large dining hall, a pantry supplied with modern conveniences, a laundry and bath rooms. A large reception room is used for students' receptions, under the auspices of the President's wife, the ladies of the faculty and the wives of the members of the faculty.

RESIDENCES for the College President, the Director of the Experiment Station, and the Farm Superintendent are situated on the campus. Cottages for farm laborers have also been provided.

A FORCING HOUSE AND A VETERINARY LABORATORY, both well fitted for their purposes, are situated on the College grounds.

THE FARM of about one hundred acres is well stocked

with the best breeds of cattle, sheep, swine and poultry, and is fully provided with improved implements and farm machinery.

Three and a half acres of ground, close to the College building are appropriated to the use of students, for athletic sports.

THE FACULTY consists of about twenty-five members, many of them of long and successful experience in practical and industrial, as well as general education.

OBJECTS.

The College is in several ways accomplishing the objects for which it has been endowed:—

I. It gives a substantial education to men and women. Such general information and discipline of mind and character as help to make intelligent and useful citizens are offered in all its departments, while the students are kept in sympathy with the industrial occupations.

II. It teaches the sciences applied to the various industries of farm, shop and home. Chemistry, botany, entomology, biology, and mechanics are made prominent means of educating to quick observation and accurate judgment. Careful study of the minerals, plants and animals themselves, illustrates and fixes the daily lessons. At the same time lessons in agriculture, horticulture, engineering and household economy show the application of science; and all are enforced by actual experiment.

III. It trains in the elements of the arts themselves, and imparts such skill as to make the hands ready instruments of thoughtful brains. The drill of the shops, gardens, farm and household departments, is made a part of the general education for usefulness, and insures a means of living to all who make good use of it. At the same time it preserves habits of industry and manual exercise and cultivates a taste for rural and domestic pursuits.

IV. It strives to increase experimental knowledge of agriculture and horticulture. The provision for extensive and accurate research, made by establishing the Experiment Station as a distinct department of the College, offers assurance of more definite results than can be obtained by ordinary methods.

REQUIREMENTS FOR ADMISSION.

1. Graduates of the Eighth grade of the district schools are permitted to enter the sub-freshman year without examination.

2. To enter the freshman year of the long courses or the first year of the short courses the student must be at least fifteen years of age, and must pass a satisfactory examination in the following subjects, using the text books named or their equivalents:

1. Reading, spelling, and penmanship.
2. Geography—Appleton's *Higher Geography*.
3. United States History—Barne's *United States History*.
4. Grammar—Maxwell's or Sheldon's *Advanced Lessons*.
5. Arithmetic—Harper's *Second Book*.

Students may be admitted without examination from an accredited high-school, academy, or other institution, if they present certificates of the completion of the subjects named above; they are also admitted upon completion of the sub-freshman studies in this College.

DIRECTIONS TO STUDENTS.

The regular examinations for new students are held on the first two days of each term. Irregular students are examined when they enter. The studies to be taken are assigned by the examiners and approved by the president. The entrance fee ($5) is then paid at the secretary's

office; and the class card naming the studies to be pursued is countersigned by the president and the secretary. The card admits the student to his classes, and when signed by the several professors entitles him to all the privileges of membership. The student returns this card to the secretary. The course of study, as thus marked out, cannot be varied by the student except upon petition to the faculty.

When students enter for the second or third terms, the cards are secured from the secretary of the faculty, the studies assigned by the president, the cards signed by the professors and returned to the secretary, as before.

COURSES OF STUDY.

The first year is the same for all the four year courses, and there is but a slight variation in the second year. The studies and training of these years have been laid out with care; and students are not permitted to vary from the course shown in the outline, except as herein provided.

1.—Students in either course of Domestic Arts take sewing and dressmaking in the freshman year, in the place of shopwork in wood and iron, as indicated by the footnote to the schedule. In the sophomore year, second term, they take lectures on cooking, and laboratory practice in cooking, in the place of trigonometry; and in the third term, lectures on the science of nutrition, and laboratory practice in cooking instead of surveying and elementary mechanics.

2.—In the several short courses, the studies of the first two years are varied far enough to meet the requirements of this class of students.

The studies of the first two years are planned to meet the repuirements of the most numerous class of students, the majority of whom attend for two years or less after completing the studies of the district schools. These two years, as now planned in the schedule, provide as broad culture in a general way, and as thorough preparation for the special courses which follow, as the College is at present able to

offer. It cannot assume, therefore, to vary the courses further than indicated above; and students are expected to pursue the studies as here laid down or as many of them as they are able to pursue.

AGRICULTURAL COURSE.

The aim of this course is the general education and scientific training of the future agriculturists of Utah. The training is as thorough as is possible in the short time allotted. The principal exercises directly related to the successful pursuit of agriculture, are taught; but no pretension is made to train specialists in any one particular branch of science. The time for this is necessarily too short.

Under *agriculture* in the junior and senior years are included a great variety of subjects, the intelligent pursuit of which requires as a foundation a certain knowledge of chemistry, physiology, biology, botany, and other sciences. The freshman and sophomore years are intended to give this preparatory training.

The Elementary Agricultural Course, extending over a period of two years, is offered to those students whose time or means will not permit them to devote four years to a training for their future vocation. It is made as practical as possible in order to meet the demands of the most numerous class.

The College also offers during the winter, a special course of lectures on practical agricultural topics, intended to reach those farmers who can leave their farms for a few short winter months only, but who appreciate the advantages of a knowledge of the fundamental principles underlying their business. The lectures in this course are of a popular character and have met with much success.

The figures in the following course schedules denote the number of hours devoted to each subject during the week.

STUDIES IN AGRICULTURAL COURSE.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Rhetoric 5	Riterature 5
Algebra 5	Algebra and Geometry 5	Geometry 5
History 5	Physics 5	Physics 5
Drawing 2	Drawing 2	Drawing 2
Elocution 3	Elocution 3	Elocution 3
	Afternoon Work.	
Shopwork 10	Shopwork 10	Shopwork 10

SOPHOMORE YEAR.

Chemistry 3	Chemistry 3	Chemistry 3
Rhetoric 2	Rhetoric 5	Rhetoric 2
Solid Geometry and Higher Algebra . 5	Trigonometry . . 5	Botany 5
Civil Government and Constitutional Law 5	Anatomy and Physiology 2	Anatomy and Physiology 5
	Afternoon Work.	
Chemistry 6	Chemistry 6	Chemistry 6
	Anatomy and Physiology 2	Anatomy and Physiology 2

JUNIOR YEAR.

Physiological Botany 3	Agricultural Chemistry 3	Agricultural Chemistry 3
Literature 5	Horticulture 5	Entomology 5
Psychology 5	German 3	German 3
German 3	Zoology 5	Zoology 2
		Rural Engineering . 3
	Afternoon Work.	
Physiological Botany 4	Mineralogy 6	Entomology 4
Bacteriology 6	Zoology 2	Zoology 4

SENIOR YEAR.

Dairying and Animal Industry 5	Political Economy . 3	Agronomy 3
Horticulture 3	Veterinary Science 5	Veterinary Science 5
German 3	German 3	German 3
Cheese Making Mondays.	Geology 3	or Literature . . . 5
	Stock Feeding . . . 2	Geology 3
	Afternoon Work.	
Dairy Practice . . . 4	Veterinary Anatomy 6	Veterinary Clinic . 4
Bookkeeping . . . 6	Stock Feeding . . 2	Geology 4

ELEMENTARY COURSE IN AGRICULTURE.

FIRST YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Grammar 5	Grammar 5
Arithmetic 5	Arithmetic 5	Arithmetic 5
Drawing 2	Drawing 2	Rural Engineering . 3
Breeds and Breeding 5	Chemistry 3	Elementary Botany 5
	Soils, Crops, etc. . . 5	
	Afternooon	
Wood Shop 10	Stock Judging . . . 2	Agricultural Practice 4
	Agricultural Practice 4	Botanical Practice . 4

SECOND YEAR.

Geography 5	Reading 5	U. S. History . . . 5
General History . . 5	Penmanship 2	Reading 2
Horticulture 3	Veterinary Science 5	Entomology 5
Penmanship 5	Stock Feeding . . 2	Dairying 5
	Afternoon.	
Iron Shop 10	Veterinary 6	Dairy Practice . . 4
	Agricultural and Horticultural Practice 2	Agricultural and Horticultural Practice

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MECHANICAL ENGINEERING COURSE.

The aim of the Mechanical Engineering Course is to afford the student such training as will qualify him to deal intelligently with engineering problems in general, and prepare him for a professional career. While the distinctive purpose of the course is to give instruction in the designing and construction of machinery, considerable instruction is given in municipal, irrigation, and general engineering, to form a basis for practice in these special branches.

The instruction in all branches aims to blend the theoretical with the practical, so that the student may become familiar not only with the purely scientific phase of the work, but with its application to modern practice. The student is brought, as early as possible, into contact with practical problems, the graphical as well as the analytical method being used throughout in their solution. Besides the practical tendency of the course, it has a high disciplin-

ary value, and is especially adapted to develop originality of thought and action.

The more strictly professional work may be classified as mathematics, physics, applied mechanics, drawing, and shopwork. Sufficient work in English, history, and other general subjects is given throughout the course to meet all ordinary demands.

STUDIES IN MECHANICAL ENGINEERING COURSE

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Rhetoric 5	Literature 5
Algebra 5	Algebra and Geometry 5	Geometry 5
History 5	Physics 5	Physics 5
Elocution 3	Elocution 3	Elocution 3
Drawing 2	Drawing 2	Drawing 2
	Afternoon Work.	
Shopwork 10	Shop Work . . . 10	Shopwork 10

SOPHOMORE YEAR.

Chemistry 3	Chemistry 3	Chemistry 3
Rhetoric 2	Rhetoric 5	Rhetoric 2
Solid Geometry and Higher Algebra . 5	Trigonometry . . . 5	Analytical Geometry 5
Civil Government and Constitutional Law 5		Elementary Mechanics 3
		Surveying 2
	Afternoon Work.	
Chemistry 6	Chemistry 6	Chemistry 6
Shopwork 4	Pattern Making . . 4	Field Surveying . . 4

JUNIOR YEAR.

Heat and Electricity 5	Hydraulics 5	Materials of Engineering 5
Calculus 3	Calculus 5	Calculus 3
Mechanical Drawing 5	Descriptive Geometry 6	Metalurgy, Iron and Steel 2
Elements of Mechanism 5	Mechanical Drawing 4	Mechanical Drawing 5
		Hydraulics 3
	Afternoon Work.	
Machine Shops . . 6	Machine Shops . . 10	Machine Shops . . 10
Physics 4		

SENIOR YEAR.

Applied Mechanics 5	Applied Mechanics 5	Applied Mechanics 5
Steam Engineering 3	Steam Engineering 3	Steam Engineering 3
Literature 5	Irrigation Engineering 5	Applied Electricity 5
Dynamics of Machines 3	Power, Measurement, and Transmission 5	Municipal Engineering 5
	Afternoon Work.	
Machine Design . 10	Machine Design . 10	Thesis 10

CIVIL ENGINEERING COURSE.

The technical instruction in this course extends over a period of two years, and is intended to afford a practical and theoretical training in those subjects needed to prepare young men to undertake, intelligently the problems that ordinarily present themselves in the profession of the civil engineer. Prominence is given to hydraulics, especially that part of the subject pertaining to irrigation systems and the use of water power. The training in surveying will qualify the student to deal intelligently with any problem that may arise in the various kinds of surveying. While in all the subjects of this course, much importance is given to the practical work in the field, yet the value of a strong theoretic training is not lost sight of; and therefore strong courses in mathematics are given, together with the courses in literature and science necessary to make up the general education of every citizen.

STUDIES IN CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Rhetoric 5	Literature 5
Algebra 5	Algebra and Geometry 5	Geometry 5
History 5	Physics 5	Physics 5
Elocution 3	Elocution 3	Elocution 3
Drawing 2	Drawing 2	Drawing 2
	Afternoon Work.	
Shopwork 10	Shopwork 10	Shopwork 10

SOPHOMORE YEAR.

Chemistry 3	Chemistry 3	Chemistry 3
Rhetoric 2	Rhetoric 5	Rhetoric 2
Solid Geometry and Higher Algebra . 5	Trigonometry . . . 5	Analytical Geometry 5
Civil Government and Constitutional Law 5		Elementary Mechanics 3
		Surveying 2

Afternoon Work.

Chemistry 6	Chemistry 6	Chemistry 6
Shopwork 4	Pattern-Making . . 4	Field Surveying . . 4

JUNIOR YEAR.

Heat and Electricity 5	Hydraulics 5	Hydraulics 3
Calculus 3	Calculus 5	Materials of Eng'ng 5
Surveying 3	Descriptive Geom'try 6	Roads and Pavements 3
Mechanical Drawing 2	Mechanical Drawing 2	Calculus 3
Elements of Mechanism 5		Metallurgy 2
		Mechanical Drawing 2

Afternoon Work.

Field Practice in Engineering 6	Drawing and Designing 6	Hydrographic Surveying and Designing 3
Physics 4		

SENIOR YEAR.

Higher Surveying . 5	Power, Measurement,	Applied Mechanics 5
Applied Mechanics 5	and Transmission 5	Applied Electricity 5
Literature 5	Applied Mechanics 5	Municipal Engineering 5
Steam Engineering 3	Irrigation Engin'r'g 5	
	Railroad Structures 3	

Afternoon Work.

Experimental Work Engineering Designs 6	Mineralogy and Assaying 6	Preparation of Thesis.

DOMESTIC ARTS COURSE.

The course for young women is in general the same as for young men in the four years' course in agriculture, except in the hours devoted to the shop and the farm. In place of these there are special studies adapted to women's work. The value and necessity of special training in household economy are too well known to require explanation. It will be seen that special attention is given to those

branches of study in which young women require proficiency, and to those studies which tend to adorn life in the sphere in which they move.

If the place given to horticulture, floriculture, and economic botany should require explanation, it may be sufficient to say that this line of work has a fascination for all classes, and everywhere claims the admiration and almost the affection of every person of true refinement. Household plants and the farm and village garden are always objects of interest and of importance to women, and often the source of physical health, inducing, as they do, exercise in the open air. This does not necessitate the added drudgery of physical work in the garden any further than pleasure may dictate. A special class is taught in floriculture, as adapted to window gardening, in the preparation of the soil, and in the growth of vegetables and small fruits. Exercises in the application of the knowledge acquired in the lecture room are a regular feature of the work.

Upon completion of the freshman and sophomore years of the regular Domestic Arts Course, the student is entitled to a certificate of graduation in the two years' course.

STUDIES IN DOMESTIC ARTS COURSE.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Rhetoric 5	Literature 5
Algebra 5	Algebra and Geometry 5	Geometry 5
History 5	Physics 5	Physics 5
Elocution . . . 3	Elocution 3	Elocution 3
Drawing 2	Drawing 2	Drawing 2
	Afternoon Work.	
Laundrying and Sewing 5	Sewing 5	Dressmaking . . . 5
Physical Culture . . 3 (Elective.)	Physical Culture . 3 (Elective.)	Physical Culture . . 3 (Elective.)

SOPHOMORE YEAR.

Chemistry 3	Chemistry 3	Chemistry 3
Rhetoric 2	Rhetoric 5	Rhetoric 2
Solid Geometry and Higher Algebra . 5	Cooking (Lectures) 5	Science of Nutrition 5
Civil Government and Constitutional Law . 5	Anatomy and Physiology 2	Anatomy and Physiology 5
	Afternoon Work.	
Fruit Work 4	Cooking Practice . 4	Cooking Practice . 4
Chemistry 6	Chemistry 6	Chemistry 6

JUNIOR YEAR.

Literature 5	German 3	Hygiene 5
German 3	Trigonometry . . . 5	German 3
Horticulture 3	Zoology 5	Botany 5
Psychology 5	Designing, Cutting and Fitting . . 5	Zoology 2
	Afternoon Work.	
Bacteriology 6	Zoology 2	Floriculture 6
	Mineralogy 6	Zoology 4

SENIOR YEAR.

Physiological Botany 3	Political Economy . 3	Literature 5
German 3	Organic Chemistry 5	German 3
Household Management 5	German 3	Geology 3
Dairying 3	Fancy Work . . . 2	Entomology 5
Cheese Making on Mondays	Geology 3	Fancy Work . . . 2
	Afternoon Work.	
Dairying 4	Book-keeping . . 10	Geology 4
Physiological Botany 4		Entomology 4

DOMESTIC ARTS SHORT COURSE.

This includes the studies of the freshman and sophomore years as given in the regular Domestic Arts Course. The privilege is given of substituting, subject to the approval of the faculty, a household economy study for some study in the regular sophomore year.

COMMERCIAL COURSE.

The object of this course is to broaden the intelligence of accountants, and to prepare students for positions as busi-

ness men, who form a large class, having a direct and important relation to the material, social, and political life of the nation. They should have associated with their technical work a knowledge of those subjects that will give them an enlarged view of their varied relations as citizen of the state. The College, therefore, offers here a much broader general education than is common in commercial courses.

The technical feature of the course is a thorough training in penmanship, typewriting, stenography, commercial arithmetic, bookkeeping, business economics, political economy, history of commerce, and commercial law. The course is broad enough to prepare students for teaching, or for the study of the law. For those who are unable to take the four years' course, a course of two years is offered, which will fairly well qualify them for positions as accountants and stenographers. The department is well equipped with desks, counters, and typewriters, making the presentation of the technical work as practical as is possible in a college.

STUDIES IN COMMERCIAL COURSE.

FRESHMAN YEAR.

FIRST TERM.	SECOND YEAR.	THIRD TERM.
Grammar 5	Rhetoric 5	Literature 5
Algebra 5	Algebra and Geometry 5	Geometry 5
History 5	Physics 5	Physics 5
Drawing 2	Drawing 2	Drawing 2
Elocution 3	Elocution 3	Elocution 3
Afternoon Work.		
Penmanship 5	Penmanship 5	Penmanship 5
Typewriting 5	Typewriting 5	Typewriting 5

SOPHOMORE YEAR.

Chemistry 3	Chemistry 3	Chemistry 3
Rhetoric 2	Rhetoric 5	Rhetoric 2
Solid Geometry and Higher Algebra 5	Trigonometry 5	AnalyticalGeometry 5
Civil Government and Const. Law 5	Anatomy and Physiology 2	Anatomy and Physiology 5
		Surveying 2

Afternoon Work.

Chemistry 6	Chemistry . . . . 6 Anatomy 2	Chemistry . . . . . 6 Anatomy or Surveying 2

JUNIOR YEAR.

Stenography . . . . 5 German . . . . . 3 Calculus . . . . . 3 Psychology 5	Stenography . . . . 5 German . . . . . 3 Calculus . . . . . 5 Zoology 5	Stenography . . . . 5 German . . . . . 3 Botany . . . . . 5 Zoology . . . . . 2 Hist. of Commerce . 5

Afternoon Work.

Bacteriology 6	Mineralogy . . . . 6 Zoology 2	Bookkeeping . . . 10

SENIOR YEAR.

Commercial Law . . 5 German . . . . . 3 Literature . . . . . 5 Com'l Calculations . 5	Commercial Law . . 5 Geology . . . . . 3 German . . . . . 3 Political Economy . 3 Business Customs . 2	Commercial Law . . 5 Geology . . . . . 3 German . . . . . 3 Literature . . . . . 5 Auditing and Expert-ing of Accounts. . 2

Afternoon Work.

Practical work in bookkeeping, banking, freighting, insurance, and kindred subjects, from 2 to 4 daily.

STUDIES IN SHORT COMMERCIAL COURSE.

FIRST YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar . . . . . 5 Algebra . . . . . 5 History . . . . . 5 Drawing . . . . . 2 Elocution 3	Rhetoric . . . . . 5 Algebra and Geometry . . . . . 5 Physics . . . . . 5 Drawing . . . . . 2 Elocution 3	Literature . . . . . 5 Geometry . . . . . 5 Physics . . . . . 5 Drawing . . . . . 2 Elocution 3

Afternoon Work.

Penmanship . . . . 5 Typewriting 5	Penmanship . . . . 5 Typewriting 5	Penmanship . . . . 5 Typewriting 5

SECOND YEAR.

Stenography . . . . 5 Rhetoric . . . . . 2 Commercial Calculations . . . . . 5 Civil Gov'nment and Constitutional Law 5	Stenography . . . . 5 Rhetoric . . . . . 5 Political Economy . 3 Business Customs . 2	Stenography . . . . 5 Rhetoric . . . . . 2 Hist. of Commerce . 5 Commercial Law . 5 Auditing and Expert-ing of Accounts . 2

Afternoon Work.

Practical work in bookkeeping, banking, freighting, insurance, and kindred subjects, from 2 to 4 daily.

GENERAL SCIENCE COURSE.

This course is believed to be especially adapted to the requirements of those preparing to study medicine or pharmacy, or to take technological training abroad. It will also offer excellent preparation for those who expect to engage in teaching, especially in the teaching of the natural and physical sciences.

STUDIES IN GENERAL SCIENCE COURSE.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Rhetoric 5	Literature 5
Algebra 5	Algebra and Geometry 5	Geometry 5
History 5	Physics 5	Physics 5
Drawing 2	Drawing 2	Drawing 2
Elocution 3	Elocution 3	Elocution 3
Afternoon Work.		
Shopwork 10	Shopwork 10	Shopwork 10

SOPHOMORE YEAR.

Chemistry 3	Chemistry 3	Chemistry 3
Rhetoric 2	Rhetoric 5	Rhetoric 2
Solid Geometry and Higher Algebra . 5	Trigonometry . . . 5	Analytical Geometry 5
Civil Government . 5	Anatomy and Physiology 2	Anatomy and Physiology 5
Afternoon Work.		
Chemistry 6	Chemistry 6	Chemistry 6
	Anatomy 2	Anatomy 2

JUNIOR YEAR.

Literature 5	Agr'l Chemistry . . 3	Agr'l Chemistry . . 3
German 3	German 3	German 3
Calculus 3	Calculus 5	Botany 5
Psychology 5	Zoology 5	Zoology 2
		Surveying 2
Afternoon Work.		
Bacteriology 6	Mineralogy 6	Zoology 4
	Zoology 2	Surveying 4

SENIOR YEAR.

Heat and Electricity 5	Political Economy . 3	Literature 5
Physiological Botany 3	German 3	German 3
German 3	Organic Chemistry 5	Organic Chemistry 5
Horticulture 3	Geology 3	Geology 3
		Entomology 5
	Afternoon Work.	
Physiological Botany 4	Analytical Chemistry 6	Entomology or . . 4
Physics 4		Geology 4

DEPARTMENTS OF INSTRUCTION.

In the previous pages the order in which studies are pursued has been stated. Under the present title a somewhat detailed account will be given of the topics embraced in the several departments of instruction.

AGRICULTURE.

I. RURAL ENGINEERING. The spring term of the junior year in the long course, and the corresponding part of the second year of the short course, are given to the various topics embraced in the general subject of rural engineering. The work covers in a general way the following topics:

1. *History, Drainage and Irrigation:* History of Agriculture, showing the successive steps by which the art has attained its present position; farm drainage, its practical effects; land needing drainage, and the different problems involved in laying out and putting in a system of drains; practical questions relating to irrigation; road making; and the selection, arrangement and management of a farm with reference to special systems to be pursued. PPOF. FOSTER.

2. *Buildings, Fences and Machinery:* How to build cheap, substantial farm cottages, barns, stables, and pens; location and interior arrangement of farm buildings; development, care and use of farm implements and machinery; the mechanical principles involved in their construction and different adjustments affecting draught; fences and gates, their necessity, cost, kinds and construction; wood for gates and fences, time to cut, conditions favorable to decay and how to prolong durability; discussion of Utah state fence laws. ASSISTANT PROF. MERRILL.

II. STOCK FEEDING. A portion of the senior year is devoted to a study of the principles underlying the profitable feeding of farm animals. The composition and requirements of animal bodies, the chemical composition of foods necessary to supply these wants, the general laws of animal nutrition and the chemical action and values of the different kinds of food are discussed. The German Standard Rations are given thorough study, special work being done in compounding Utah foods. The student calculates the nutritive ratios, showing in what proportions the several foods may be used to make properly balanced rations for the different purposes of feeding, without the loss of more than a small percentage of any of the nutrients. A consideration of the proper foods for each class of animals, whether fed for labor, growth, milk, or meat production, is made prominent. The progress and results of the feeding experiments at the various Agricultural Experiment Stations are also carefully reviewed and discussed. PROF. FOSTER.

III. AGRONOMY. During the spring term of the senior year the following sub-divisions of this subject are taken up:

1. *Soils:* Their origin, composition, physical and chemical properties, classification, amelioration, and relation to climate; the general management of different soils and subsoils with their relation to successful crop production.

2. *Manures:* General principles relating to the use of manures; natural and artificial manures; the sources and composition, differences in character, and the value of liquid and solid manures of different animals for different purposes; handling and preservation of natural manures; application of manures to different soils and for various crops; reclamation of alkali soils and worn out soils; preservation of original soil fertility.

3. *Farm Crops:* Their history, uses, composition and adaptability to climate; the cultivation, harvesting and preservation of different crops; the principles of rotation; the system of rotation best suited to this state, taking into consideration the distribution of labor, the production of man-

ure, and the extermination of weeds; summer fallow; the management of meadows and pastures and the best kinds of tame grasses for the State as shown by experiments at the Station and in other parts of the State; tillage as a means of conserving soil moisture. PROF. FOSTER.

IV. ANIMAL INDUSTRY.

1. *Breeds of Live Stock:* This includes the history and description of the different breeds of stock found on the farm, their origin and development into the specialized animals of to-day; the effect of climate and management on the animals, and their adaptability to various localities and purposes.

2. *Breeding of Live Stock:* This deals with the law of reproduction, heredity, reversion, cross-breeding, in-breeding, variation, selection, period of gestation, pedigree, etc.

3. *Management of Live Stock* includes a practical application of the principles of breeding, with a full description of the methods of caring for the different classes of live stock from birth till final disposition.

4. *Judging of Live Stock* or *Animal Exterior* aims to put in practice the knowledge gained in the class room; the students from exterior points tell the relative values of the animals for special purposes, and as far as possible give reasons for the decisions rendered. PROF. LINFIELD.

V. DAIRY HUSBANDRY. Dairying, as taught, deals principally with milk, its care and manufacture both in the factory and dairy. The farm problem of milk production is discussed under Animal Industry.

1. *Milk:* The elaboration, composition and fermentation of milk; the testing of milk, with a description of the methods used in paying for milk by test and in determining the worth of milk. A brief outline is also given of the fermentation of milk, or bacteriology as applied to milk and dairy products.

2. *Buttermaking:* The different methods of creaming milk and getting the best results, are described; the hand-

ling and ripening of the cream, churning, salting, working, packing and marketing the butter.

3. *Cheesemaking:* Cheddar cheesemaking is described; the making of a uniform product and dealing with practical difficulties are fully illustrated; a brief description is also given of the manufacture of other kinds of cheese, particularly of such kinds as may be made in a home dairy.

4. *Factories:* Factory organization; the building, equipment and management of factories are fully treated.

5. *Practical Dairying:* The college dairy is equipped with the best modern apparatus for practical dairy work, and from 1,300 to 3,000 pounds of milk are handled daily; factory and farm dairy methods are illustrated, and the student becomes familiar with all phases of dairy work by actual practice in the dairy, the aim being to familiarize him with the best methods of practice as discussed in the class room. PROF. LINFIELD.

VI. IRRIGATION ENGINEERING is intended to include the mechanical principles of draining and irrigating farm lands; it occupies five hours weekly for about four weeks in the second term of the senior year of the long course, or of the second year of the short course. PROF. SWENDSEN.

BIOLOGY.

PROFESSOR LANGTON.

I. ANATOMY AND PHYSIOLOGY. Lectures and recitations are given on human and comparative anatomy, illustrated by models, anatomical preparations, diagrams and dissections. The lecture course is supplemented, both in the winter and spring terms, by laboratory work, consisting of dissections of small animals; the study of osteology and a consideration of the elements of histology are also undertaken.

II. GENERAL BIOLOGY. The course of lectures on general biology and the accompanying laboratory work cover the usual range of topics. The difference between living and dead matter is reviewed, and such subjects as protoplasm, cells, tissues and organs are considered as an introduction to specialized work. Types of the lower vegetable kingdom (not included in the botanical course) and selections from the invertebrate and vertebrate divisions of animal life are taken for illustration and for examination in the laboratory.

III. ZOOLOGY. A comparative review is given of the various functions concerned in animal life and their adaptability to the environments of the different classes of animals. The classification of the animal kingdom, the distribution of animals according to place and time, their present location and their primeval forms are considered.

BOTANY.

PROFESSOR HEDRICK.

I. STRUCTURAL BOTANY. Work in structural botany is required of the sophomores in the Agricultural Course, and of juniors in the General Science, Domestic Arts, and Commercial Courses. The text book used is Gray's *Lessons in Botany*. The aim is to help students to become familiar with the higher plants, the terms used in describing them, and their classification. Students are provided with microscopes and disecting instruments for laboratory work, but must furnish their own collecting and mounting outfits. Fifty mounted and named plants are required. The work is given five hours a week in the third term.

II. PHYSIOLOGICAL BOTANY. Juniors in the Agricultural Course and seniors in the General Science and Domestic Arts Courses spend three hours a week in recitation and four hours a week in the laboratory during the first term in Physiological Botany. Plant anatomy, and the

functions, growth and nutrition of plant organs are studied. Bessey's *Essentials in Botany* is used as a text book. All laboratory equipment and materials are furnished.

CHEMISTRY.

PROFESSOR WIDTSOE AND MR. STEWART.

I. ELEMENTARY CHEMISTRY. This is a study of the important facts and fundamental theories of chemistry; the laws of chemical combination; the writing of reactions, and practice in solving stoichiometrical problems, together with the applications of chemistry in the arts and manufactures. Students taking this subject must also take the course in elementary practical chemistry.

II. ELEMENTARY PRACTICAL CHEMISTRY. This course supplements the preceding course and furnishes the necessary practical preparation for qualitative analysis. The non-metallic elements, mainly, are studied with reference to their combinations with each other; their reactions are verified, and the facts and theories of the lecture room are tested by experiments.

III. QUALITATIVE ANALYSIS. This course runs parallel with, and supplements the descriptive study of the metals and their compounds. Under the direction of the instructor in chemistry the students apply with their own hands the re-agents necessary to determine the composition and properties of chemical compounds. They thus gain a practical knowledge of the methods of chemical analysis and manipulation. Each student is required to analyze and report on forty unknown substances. This work is deemed extremely important from an educational as well as from a practical point of view. Laboratory work occupies six hours a week for thirty weeks.

IV. QUANTITATIVE ANALYSIS. In this course the student is given practice in the typical methods of proximate and ultimate quantitative chemical analysis. After the

necessary introductory practice samples of waters, soils, ores, agricultural products, and foods, are analyzed and reported upon. The work of the Experiment Station chemical laboratory furnishes a good opportunity for the study of methods of analysis. The course consists largely of laboratory work.

V. ORGANIC CHEMISTRY. This course is planned for students who intend to fit themselves for professional work in chemistry. It consists of a brief survey of the reactions and compounds of the fatty and aromatic series of hydrocarbons and their derivatives, together with a full discussion of the nature and influence of molecular structure. In the laboratory the student makes a number of organic preparations, which in their formation involve the methods of oxidation, reduction, substitution and synthesis.

VI. AGRICULTURAL CHEMISTRY. This is a series of lectures treating of the chemical problems of agriculture; composition of plants; sources of plant food; chemistry of animal nutrition, soils and dairy products. In the laboratory are taught the methods of agricultural analysis.

NOTE.—Each student taking a laboratory course in chemistry is required to deposit $2.50 for the first term and $1.25 for each succeeding term, to pay for chemicals, and to cover breakage.

VII. CHEMISTRY OF FOODS. This is a laboratory course, and aims to make the students familiar with the constituents of the common foods. By the aid of the microscope and chemical re-agents, flour, bread, meats, peas, beans, spices, milk, and other dairy products, and various vegetables, are separated into their components, and each component subjected to special tests. The study has an important bearing on the science of nutrition.

COMMERCIAL BRANCHES.

PROFESSOR FARIS.

I. PRACTICAL BOOKKEEPING. The student obtains some capital, rents a place of business, deposits his money

in the bank, transacts all kinds of business, thereby bringing into daily use such business forms as notes, drafts, checks, bill heads, statements, shipping invoices, account sales, receipts, deposit slips, certificates of deposit, mortgages, deeds, leases, insurance policies, bills of exchange, and bills of sale. He is keeping books according to the shortest and most approved methods in various kinds of business, such as general merchandise, grocery, dry goods, clothing, coal, lumber, furniture, drug, jobbing, commission and shipping, brokerage, real estate, and for joint stock companies and corporations. Various business relations are entered into in the formation of agencies, partnerships, joint stock companies and corporations.

II. HISTORY OF COMMERCE. This work is done by recitations and lectures, The student makes a careful study of the principal countries of the world from which such staple articles of commerce as food, textile and mineral substances, metals and manufactured products are obtained. He notes the kinds and amount of such products from those countries, and the dependence of each upon every other for the necessaries and luxuries of life; he learns how markets are created and controlled; how waterways and railways afford a ready means of transportation and influence trade; and how the improved mail, postal, telephone and telegraph services facilitate the interchange of thought and also influence trade. Statistics are gathered showing the magnitude of the world's production. Practical commercial problems of the day are discussed in class.

III. COMMERCIAL LAW. This embraces a study of the customs and the law of the nature, formation, operation, interpretation, and discharge of contracts, including agency, partnership, corporation, bills, notes and checks, purchase and sale of personal property, guarantee or suretyship, limitation of the time to sue, commission merchants and brokers, agreements for personal services, bailments, insurance, telegraphic communication, patents, copyright, trade

marks, real estate conveyances, and the business and legal forms that are used to carry on trade. PRESIDENT TANNER.

IV. COMMERCIAL CALCULATIONS. This consists of a drill in percentage, profit and loss, commission, interest, discount, storage, equation of accounts, partnership settlements, and all the problems that the average business man is called upon to solve. Short methods are studied, and practical devices presented.

V. POLITICAL ECONOMY. The economic laws of trade, the general principles of Political Economy technically applied to commerce, and general business methods, are carefully examined. PRESIDENT TANNER.

VI. AUDITING AND EXPERTING OF ACCOUNTS. The duties, qualifications and requirements of expert accountants are carefully studied. Books suitable for different kinds of business with the most approved ruling, special columns etc., are discussed. Much practical work is given in opening and closing sets of books used in various business enterprises.

VII. BUSINESS CUSTOMS. The fundamental principles of bookkeeping are here applied according to modern ideas of business, with its complex and exacting requirements. The subjects of banking, securities, exporting and importing, railroading, business correspondence and every day business transactions, are carefully examined from a practical standpoint. Blanks and business forms of many kinds are placed in the hands of students for discussion and reproduction.

VIII. PENMANSHIP. A plain legible style of writing, with a rapid movement, is taught daily throughout the freshman year. It is required of commercial students; elective to others. SEC. WILSON.

IX. STENOGRAPHY. This is required of second year students in the Short Commercial Course, and of junior students in the four years' Commercial Course. Graham's system of Standard Phonography is taught. The class

is given one hour's instruction daily throughout the year. MR. DRYDEN.

Text Book: Graham's *Handbook.*

X. TYPEWRITING is required of all first year students in both commercial courses. Three different kinds of machines are used, the Remington, the Caligraph, and the Smith Premier. An hour a day is given to typewriting throughout the year. MR. DRYDEN.

DOMESTIC ARTS.

I. HOUSEHOLD ECONOMY.

MRS. COTEY.

EXPLANATION. The course for young women gives the same general training in English, German, Mathematics and Science that is given in the other courses, together with special studies adapted to woman's work.

1. LAUNDRYING occupies the fall term and consists of practical work alternating with lectures. The practice includes plain white washing and removing stains, clear starching, best methods of doing up fine mull, of ironing shirts, cuffs and collars, washing flannels, and cleaning silk and fine woolen goods. The lectures treat of the chemistry of the various materials used, and of hard waters and the process of softening them. Soaps, washing fluids, bleaching powders, bluings and starch, are discussed in their scientific and practical relations to laundry work.

2. FRUIT WORK includes canning by various methods, and making all kinds of preserves and marmalade; different methods of making jellies, and experiments with green and ripe fruits; the making of all kinds of ketchups, spiced fruits, sweet and sour pickles, table sauces and meat relishes; the preparing of fruit juices, cordials and syrups. The latter part of the term's work is a course of lectures on the chem-

ical nature of fruit, its acids and sugars; the value of fruit as food, and its action on the human sytem; the causes of fruit fermentation, and a sudy of antiseptics.

3. COOKING LECTURES treat of marketing and the selection of food; general rules of measuring and mixing; best methods of baking and boiling; deep and shallow frying; the general chemistry of cooking; carving and serving of food.

4. COOKING PRACTICE includes all kinds of plain and some fancy cooking, covering in a general way all the subjects with which a housekeeper in moderate circumstances needs to be familiar. Demonstration lessons are given at various times throughout the term on subjects difficult of treatment in the general practice. A three-course lunch is served daily during the winter term. Members of the class take turns in presiding as hostess at the table, carving and serving plates and looking after the needs of the guests; they also take turns in waiting upon the table. The confidence and skill thus acquired are invaluable to them.

5. SCIENCE OF NUTRITION is a study of foods, their chemical composition, characteristics, digestibility; the way in which they nourish the body; the best foods to be given in certain diseases; the best food for young children; effect of age, climate and occupation on amount and kind of food required. In connection with these lectures, about forty lessons are given in preparing food for the sick.

6. HYGIENE treats of sanitary conditions about the home; dangers from damp and unclean cellars, foul drains and sinks; ventilation, heating and lighting; instructions especially necessary to women on the care of personal health; home nursing, with illustrative lessons on changing beds for the sick.

7. HOUSEHOLD MANAGEMENT consists of lectures on the convenient arrangement and economical furnishing of rooms; the best methods of doing all kinds of housework, with a view to economy of time and strength; duties of

mistress and servants; entertainment of guests, and many other subjects of interest to the home-maker.

8. AESTHETICS is the science of taste and beauty. The course includes talks on fine china, pictures, furniture, decorations for the home, harmony of colors, taste in dress, and kindred subjects.

II. SEWING.

MISS BOWEN.

EXPLANATION. Besides the general advantages derived from industrial education, the object of this branch is to give a practical training in the sewing which every household requires. Neatness of work is insisted upon. The student provides material and makes her own garments.

1. PIECE SEWING. Practice is given first in the various hand stitches used in muslin and woolen goods; overhanging, running, hemming, hemstitching, overcasting, felling, gathering and stroking gathers, buttonholes, gusset, patching and darning, French hem on damask, etc.

2. DRESSMAKING. At least two muslin garments are made. A gown is cut out, basted, and entirely made, by the student.

3. DESIGNING, CUTTING AND FITTING. Instruction is given by talks on grace in design of costume and harmony of color. Special attention is given to hygienic modes of dress. The student is taught to make drawings of the costumes which she designs. She also learns to draft patterns from measurements. Further practice is given in cutting and fitting.

4. FANCY WORK. This course includes Kensington embroidery, Roman cut-work, Spanish laid-work, drawn-work, jeweled embroidery, and modern lace-making.

DRAWING.

PROFESSOR ROBINSON.

1. FREEHAND DRAWING. This consists in lessons and practice, perspective sketching from casts, and simple studies in light and shadow. It is required of all freshmen, the exercises coming three times a week during the year. It is made to include industrial design.

The junior students in the Domestic Arts Course have special training in designing and elementary art, suitable for young women.

2. MECHANICAL DRAWING is taught during the entire junior year. Students in this class are required to make working drawings, both detail and assembly, from measurement. Simple designs illustrating the principles taught in the class in mechanism form a prominent feature. Neatness and accuracy of execution determine largely the standard of marking.

3. DESCRIPTIVE GEOMETRY is confined to the representation of problems, and the solution of problems relating to geometrical magnitudes in space. It is made to cover orthographic projections and development; projections of plain and solid figures; curved surfaces and tangent planes; shades and shadows; construction of maps; solutions of problems relating to geometrical magnitudes.

ELOCUTION AND READING.

The object of this department is to make good readers and fluent speakers. Particular attention is paid to orthoepy and the definitions of words.

1. READING. This study is required of all sub-freshmen in daily recitation. The best dictionaries are in use, and students have constant practical drills in orthography, phonetic spelling, marking and defining words, and

articulation. The principle aim in the work however is to develop easy, natural readers who will be able to express the thought of the author in a clear and impressive manner. The work of the past year consisted of a study of *Julius Caesar, the Merchant of Venice* and miscellaneous readings.

2. ELOCUTION. The work in this study, taken by the freshmen, is a continuation of that done in the sub-freshmen year, also practical work in recitation and impersonation. Each student is expected to learn and present a recitation to the class once each month or as often as the number in the class or division will allow.

ENGINEERING.

I. CIVIL ENGINEERING.

PROF. SWENDSEN.

1. HYDRAULICS. This includes a discussion of the fundamental laws governing the equilibrium of fluids; the flow through orifices and pipes, over weirs and in open channels; the measurement of water; the action of water upon vanes, water-wheels and pumping engines. Winter and Spring terms.

2. IRRIGATION SYSTEMS. Includes the location, grades, cross-sections, etc., of canals; the design and construction of flumes, head-gates, diversion weirs and dams; pipe irrigation and inverted siphons; rainfall, evaporation and seepage; methods of irrigation; duty of water; windmills, artesian wells, etc. Winter term.

3. ELEMENTARY SURVEYING embraces the adjustment and care of instruments, and a treatment of the general methods of farm, city, railway, topographical and hydrographic surveying. The practical work in the field and drawing room will receive particular attention. Fall and Spring terms.

4. HIGHER SURVEYING includes a treatment of triangulation systems, construction of stations, measurement of base lines, determination of the meridian, and the general application of precise methods in field and drawing room practice. Fall term.

5. ROADS AND PAVEMENTS. Country roads are discussed along with highways, their location, construction and maintenance; the paving of city streets and sidewalks; the materials used and the mode of construction.

6. RAILROAD STRUCTURES will treat of the parts of the road requiring special designs, such as masonry, retaining walls, trestles, tunnels, watch towers, water supply, culverts, etc. Winter term.

7. MUNICIPAL ENGINEERING will deal with sources and methods of city water supply, problems and plans of sewerage, systems and methods of sewerage disposal, and questions of rapid transit and light. Spring term.

8. THESIS. This may consist of some original engineering design, a paper on some branch of civil engineering, or a discussion of some past achievement in the profession. It is expected to be a somewhat exhaustive treatment of the problem considered.

II. MECHANICAL ENGINEERING.

PROFESSOR JENSON.

1. ELEMENTS OF MECHANISM. This includes a consideration of the various forms of motion and its production; link motions and their modification as used in machinery; cam and wiper outlines; wheel trains and aggregate motions; design and construction of gear teeth; mechanism of special machinery. This subject deals with the purely geometrical relations of machinery, rather than with the form and design of articulating parts.

2. METALLURGY OF IRON AND STEEL. This embraces a study of the principal iron ores and their reduction according to modern methods, and the processes employed in the preparation of the iron into the various forms used for general construction purposes.

3. STEAM ENGINEERING. This begins with a study of the various forms of valve gears now in common use, which is followed by the study of the various forms of engines; the principles of thermodynamics according to the mechanical theory of heat and its application to the steam and other vapor engines; boilers and boiler design and construction; also methods of testing steam engines and steam boilers. A careful study is made of such data as have been secured from reliable tests in lieu of making actual tests.

4. APPLIED MECHANICS. A general discussion is given of the relation of forces and their effects in the production of motion; the derivation and application of formulæ, based upon the strength of materials as determined from actual experiment on full sized pieces, and used in determining the size of parts to be used in all engineering structures; the constructive qualities of the various woods and metals used in engineering practice. Much stress is laid upon this subject as being the chief corner stone in the foundation of an engineering profession.

5. DYNAMICS OF MACHINES. The general effects of the inertia of the moving parts of machines are discussed.

6. POWER MEASUREMENT AND TRANSMISSION. This is a study of theory of friction and suitable coefficients for use with various materials and kinds of joints; friction brakes and dynamometers; lubricators and their uses; transference of power by means of rigid contact, rope and belt driving, compressed fluids, and electrical transmission. Power absorbed in driving the various machines in the shop.

7. MACHINE DESIGN. In machine design each student is required to make a certain number of designs carrying out the principles of applied mechanics and dynamics of

machines in all calculations. Boilers, parts of engines, pulley and gear shafts, and hangers, form suitable examples for this work. The class work consists of lectures and drawing.

8. THESIS. In general a graduating thesis in this course should consist of the execution of an original design with a descriptive dissertation, or a discussion of some current engineering problem, or the result of some original research, experimental or theoretical.

For a description of a course in hydraulics, municipal and irrigation engineering, materials of engineering, applied electricity, see "Civil Engineering."

For a description of courses in mechanical drawing and descriptive geometry, see "Drawing."

For shopwork, see "Mechanic Arts."

For other courses, see "Physics and Mathematics."

ENGLISH AND GERMAN.

I. ENGLISH LANGUAGE AND LITERATURE.

PROFESSOR MACEWAN.

1. ENGLISH GRAMMAR. The work in English embraces grammar, rhetoric and literature, and runs parallel through all the four-year courses. In grammar, after a review of etymology, special attention being given to the formation of the verb, the structure of the English sentence is carefully examined. Nearly a term is spent in analyzing sentences from classic authors. This work occupies the fall term.

2. ELEMENTARY RHETORIC. This includes the principles of invention, the elements of style and the different forms of composition. The preparation of manuscript for the printer is taught in connection with the written work. Essays are required once a fortnight, mostly reproductions, illustrating the laws of description and narration. The nar-

rative poems from the textbook in literature, with the last class, *British Masterpieces* and *The Iliad* furnish matter for reproduction and study in versification. This work occupies the winter term.

3. ADVANCED RHETORIC. Instead of more advanced work in the principles of style, the rules of description, narration, exposition and argumentation are studied; and to illustrate and enforce these, some masterpieces in each department are critically examined. Speeches of Burke and Webster furnish suitable material for the study of argument. Frequent oral and written exercises make the work entirely practical; during the last term debates, written and oral, are had on questions of general interest. Each student presents numerous written exercises. The work goes through the sophomore year, twice a week the first and third terms, and five times a week the second term.

4. LITERATURE. The first work in literature follows the elementary rhetoric, occupying the third term of the freshman year. It is a critical study of the short, complete classics—essays, poems of various kinds, speeches, sketches and stories. Enough of each author and his times is told in familiar lectures to awaken interest, and show the occasion of the production. In this work constant reference is made to rhetorical principles, and the style of different authors is carefully compared, and both style and form are studied with reference to the thought and sentiment. The following texts have been read:

Shakespeare's *Merchant of Venice;* Bacon's *Essays;* Milton's *L'Allegro, Il Penseroso, Hymn,* and *Lycidas;* Addison's *Sir Roger De Coverly;* Pope's *Rape of the Lock;* Gray's *Elegy in a Country Churchyard;* Goldsmith's *Deserted Village,* and *Traveller;* Burn's *Cotter's Saturday Night,* and some other poems; Wordsworth's *Ode on Immortality,* and narratives from *The Excursion;* Irving's *Sketch-book;* Tennyson's *Ulysses, Locksley Hall, Enoch Arden;* Dickens's *Christmas Carols;* selections from Emerson, Lowell, Holmes, Longfellow, and Hawthorne; the selections in Swinton's *Master-*

pieces; Pancoast's *Representative Literature;* Painter's *Introduction;* Syle's *From Milton to Tennyson,* and *British Masterpieces.*

5. HISTORY OF LITERATURE. The second course is given to a historical survey of literature, from Chaucer to the present time. Sufficient attention is given to the leading authors of the different periods to make evident the characteristics of their thought and style. The English drama receives special attention. Much of the time is given to the critical reading of such texts as supplement, but not duplicate the first and third courses, much of the study being reported in essays. This is the work of juniors and seniors for the first term.

6. LITERATURE: MASTERPIECES. The last term of the senior year is given to the study of longer masterpieces. All the important forms of literature are laid under contribution—the drama, the epic, the lyric, the novel, the essay biographical and critical, the oration and history. One week is given to each piece selected. The work of the class-room is largely a report of students, either oral or written, on what they have done by themselves. The following texts, changing somewhat from year to year, have constituted the course:

Shakespeare, two great tragedies, *Hamlet, Macbeth, Lear, Othello;* Webster, *Reply to Hayne;* Burke, *Conciliation with American Colonies;* Macaulay, *Essay on Milton* and *Addison;* Milton's and Carlyle's *Essay on Johnson;* Milton, *Paradise Lost, I.* and *II.; Samson Agonistes;* Carlyle, *Essay on Burns, Hero as Prophet;* Tennyson, *Princess,* or selected poems; Motley, *Peter the Great,* or Southey, *Nelson;* George Eliot, *Silas Marner;* Wordsworth, *Selected Poems;* Byron, *Childe Harold;* Goldsmith, *Vicar of Wakefield;* De Quincy, *Revolt of the Tartars;* Defoe, *Journal of the Plague;* Addison, *Spectator;* Browning, *Blot in the Scutcheon,* etc., or select poems.

II. GERMAN.

ASSISTANT PROFESSOR ROBINSON.

This is the only foreign language taught in the institution, and is in four courses, three hours a week, during both the junior and senior years. The Germans are now the leaders in agricultural science. The advanced student of agriculture must be able to read the literature on his subject coming from the German press. Moreover a knowledge of German is deemed essential to a liberal education. These are the reasons for the appearance of this language in these courses. Oral and written exercises are accompanied by conversation, making more familiar the vocabulary and accustoming the ear as well as the eye to the words. In the time allotted only the framework of the language can be mastered; but enough is given to enable the student to prosecute independent study and consult German books.

After completing the *Joynes-Meissner Grammar* and *Reading-book*, students are given such scientific reading material as will best equip them for using works of reference and the publications of scientific institutions and societies; or such selections from classic German literature as are adapted to awaken an interest and stimulate further reading. Dippold's *Scientific German Reader; Wilhelm Tell, Nathan der Weise, Egmont, Hermann und Dorothea, Reisebilder, Ekkehart, Peter Schlemihl, Das Kalte Herz, Soll und Haben.*

ENTOMOLOGY.

PROFESSOR HEDRICK.

The work in entomology is required of juniors in the Agricultural Course and of seniors in the General Science and Domestic Arts Courses. It consists of recitations five hours, and laboratory work four hours a week during the third term. Comstock's *Manual* is used as the text-book and guide for laboratory work. The students are expected

to acquire a general knowledge of the structure and classification of insects, especially the common insect pests. Insecticides and methods of applying them are given some consideration.

GEOLOGY AND MINERALOGY.

I. MINERALOGY AND ASSAYING. A systematic study is made of the important mineral species according to Dana's classification. Much practice is given in blow-pipe analysis and determinative mineralogy; and in connection with the former, the simple methods of dry assaying are taught. To those especially interested in the subject, opportunities are given for practice in all methods of dry and wet assaying.

II. GEOLOGY AND LITHOLOGY. A course is given in general and economic geology in which particular attention is given to dynamical and structural geology. Along with the occurrence of rocks, their mineralogical composition is also studied. The instruction is based on a text-book, but supplementary lectures are given. Weekly excursions give practice in geological field work and material for reports.

HISTORY.

PROFESSOR THOMAS.

The chief objects of this study are the fixing of the principal great historical events in the memory, the training of the reason and the historic sense, and the cultivation of the taste for historical reading. Outlines are made and memorized, and questions are suggested that require research, and stimulate independent thought. While orignal sources cannot well be examined, considerable reference reading is required. For this purpose, the College library is better equipped in the department of historical literature, than in any other. A general textbook is used; but no slavish following of any one book is expected. Time is

taken to compare conflicting statements of fact, and different interpretations. All available sources of information are used. The work extends through the first term of the freshman year, five times a week.

I. GRECIAN HISTORY. The first period of study is given to Grecian history, some attention being paid to Oriental nations, especially to those events which influenced in a noticeable manner subsequent European nations. Most of the time is occupied with a study of the conflicting cities and States of Greece, their advancement in oratory, literature and the fine arts.

II. ROMAN HISTORY. Attention is then given to the history of Rome—her rise, rapid extension, wonderful vigor, the extension of her power, her fall and final extinction, the survival of her better qualities, and the gradual development of the nations of modern Europe.

III. ENGLISH HISTORY. In succession attention is given to the history of England as the great exponent of human liberty, the rise and extension of her institutions, the settlement of her American Colonies, and the growth of her ideas and civilization on American soil.

HORTICULTURE.

PROFESSOR HEDRICK.

This subject occupies five hours a week during the second term of the junior year of the long Agricultural Course, and during the same terms of the second year of the short course. Three hours a week are also devoted to this subject during the first term of the senior year in the Agricultural, Domestic Arts and General Science Courses.

The work is as follows:

I. PROPAGATION AND PRUNING. The first term is occupied with plant propagation; a discussion of the principles underlying it and of special methods, as seeding, budding

and the various methods of grafting. Some time is also devoted to a discussion of the general principles on which the practice of pruning is based. During this term two hours each week are devoted to pruning, grafting, making cuttings and other work in the propagating house.

II. POMOLOGY. In the second term the subject of pomology proper is taken up, including the choice of fruit lands, their cultivation and the maintenance of fertility; the planting of orchards and other fruit plantations; choice of trees and selection of varities; the diseases of plants and the principles and practice of spraying.

III. FLORICULTURE. This is taught during the spring term of the junior year in the Domestic Arts Course. It deals with the propagation and care of house plants, the flower garden and the planting and care of the home grounds. So far as possible the work in the class-room is supplemented by actual practice in the green house and on the college grounds.

MATHEMATICS.

PROFESSORS SNOW AND LANGTON.

I. ALGEBRA. A thorough drill in the elements of algebra, with special attention to fractions, factoring, simultaneous equations, involution and evolution, and radical expressions, is given all freshmen every day during the first term.

II. PLAIN GEOMETRY. Oral and written recitations in the elements of plane geometry are required of freshmen half the time during the winter and spring terms.

III. HIGHER ALGEBRA embraces a study of quadratic equations; simple and indeterminate equations, inequalities, theory of exponents; logarithms; ratio and variation; series and the binomial and exponential theorems, during the fall term of the sophomore year.

IV. SOLID GEOMETRY involves recitations on the relation of lines and planes in space; area of surfaces; volume of solids; and the solution of practical problems. It comes in the first term sophomore year.

V. TRIGONOMETRY embraces a study of the use of logarithms in the solution of right and oblique triangles, and the deduction and use of trigonometric formulæ. Second term sophomore year.

VI. SURVEYING occupies eleven weeks, two recitations a week, and four hours field practice a week. The solution of practical problems; the use of the compass and transit in the measurement of distance by triangulation and in land surveying; and the use of the level in establishing grades, —are the most important features of the work.

VII. ANALYTICAL GEOMETRY embraces the reference of points and lines to co-ordinate axes and the deduction of equations of the straight line and curves of the conic sections.

VIII. CALCULUS. 1. *Differential.* Development of the fundamental principles and formulæ of the differential calculus; applications to various problems in indeterminate forms, tangents and normals to plane curves, and maxima and minima, etc.

2. *Integral.* Elementary forms of integration, development of formulæ; applications in determining length of curves, areas, center of gravity, moment of inertia, volume of solids, etc. Fall, winter and spring terms.

MECHANIC ARTS.

PROFESSOR JENSON.

I. TECHNICAL INSTRUCTION.

Instruction is given during the regular shop hours on the various operations throughout the course, and includes the preparation of steel and iron for the mechanic arts; the felling and seasoning of timber; selection of materials, etc

II. SHOP PRACTICE.

1. BENCH WORK IN WOOD includes exercises in planing, sawing, chiseling, rabbeting, plowing, splicing, mortising, tenoning, dove-tailing, framing, paneling, and the general use of carpenters' tools.

2. WOOD TURNING covers all the principles of straight turning, face plate, and chuck work.

3. IRON FORGING embraces drawing, bending, twisting, cutting, punching, upsetting, welding, and the use of flatters, fullers, swages, etc. These principles are applied in the making of tools for use in the shop. Other articles are made, such as andirons and ornamental gates, if time permits.

4. STEEL FORGING embraces the forging and tempering of punches, cold chisels, drills, lathe and planer tools, springs, and the welding of steel to iron; annealing, case hardening, and coloring are also taught.

5. CABINET MAKING is the actual construction of articles of furniture, this being a practical application of the principles learned in bench and lathe work, with some little wood carving added.

6. PATTERN MAKING embraces a number of exercises in the construction of simple and built up patterns and core boxes.

7. VISE WORK, in iron, embraces chipping, filing, scraping, thread cutting, hand polishing, cutting of key seats, riveting, brazing and soldering.

8. MACHINE WORK embraces straight, taper and eccentric turning, thread cutting, face plate, and chuck work, taper boring, use of boring bar, and milling on the engine lathe, surfacing, cutting of V, dove-tail, and T groves, and key seating on planer, plain milling, grooving of taps, reamers, etc., gear cutting and grooving of twist drills on milling machines, drilling and boring in drill press, grinding and buffing on emery wheel.

METEOROLOGY.

ASSISTANT PROFESSOR DRYDEN.

This is an optional course for junior and senior students, and includes an elementary study of air pressure, humidity, temperature, rainfall, evaporation, wind velocity, theory of storms, methods of forecasting, and a general study of the United States Weather Service, with special reference to the relation of climate to health and to agriculture. The reading of the weather instruments in use at the College is made a part of the work.

MILITARY SCIENCE AND TACTICS.

LIEUTENANT DUNNING.

This course is in charge of an officer of the United States Army, detailed by the Secretary of War. The Government furnishes Springfield cadet rifles and equipment for infantry drill and two 3-inch rifled-cannon for artillery instruction. A uniform of dark blue is worn by the cadets, the cost of which, including cap, is about fifteen dollars.

The attention of students intending to enter College is called to the fact that this uniform has been found more serviceable than a suit of civilian clothes of the same price, and students are required to make arrangements so as to be able to order this uniform when they enter. On all occasions of drill, or when students are receiving any other military instruction, the uniform prescribed by the College must be worn.

I. INFANTRY. This includes all the movements described in the drill regulations of the U. S. Army, from gymnastic instruction in the setting-up exercises, the school of the soldier, and bayonet exercise, to the drill by company and battalion; exercise in estimating distances by sign and

also by sound; target practice with rifle, for which the government makes an annual allowance of ammunition; instruction in signaling with flag and in military telegraphy.

II. ARTILLERY. This embraces drill in the manual of the piece, and target practice when practicable.

III. THEORETICAL INSTRUCTION. During the winter months when outdoor drills are necessarilly suspended, instruction is given by means of recitation from the drill regulations and by lectures on the elements of military science. Daily from 11:30 a. m. to 12:20 p. m. Required of all students except juniors and seniors.

VOCAL MUSIC.

MRS. GOODWIN.

Details as to time of lessons and conditions will be announced at the commencement of each term.

That music is a great, perhaps the greatest, refiner of human nature is incontestible. Cruelty and brutality, generally the accompaniment of unmelodius races, become rare as the musical feeling grows, and music is a predominant characteristic of refined and gentle natures. Undoubtedly, therefore, music may be made a potent factor in civilization, because the tenderest feelings of men cultured or uncultured, are awakened by it. This result may be obtained more easily when the heart is fully enlisted and the faculties of the mind are fully exercised, thus making music one of the noblest factors in the education of the soul. It is intended to foster the taste for music among the students as fully as is consistent with the pursuit of their studies in other directions.

PHILOSOPHY.

PSYCHOLOGY is a study of the principal facts and theories of the science of mind, as an introduction to philosophy. The bearing of the subject on education is emphasized, and the student is made familiar with the great names in philosophy, and with the main doctrines of the different schools.

PHYSICAL CULTURE.

The chief aim in this department is not so much to develop muscle as to relieve the mental strain. Special attention, however, is given to any desiring a course for development or to overcome physical defects.

The exercises consist of military, fancy and calisthenic marching; Swedish and free gymnastics; light and heavy work with apparatus: Indian clubs, dumb-bells, wands, pulley weights, rings, parallel and horizontal bars, ladder, ropes, horse, etc.

PHYSICS.

PROFESSORS JENSON AND SNOW.

I. ELEMENTARY PHYSICS. This is an introductory science course; in which the important laws of natural philosophy are stated and discussed. The current hypothesis of the constitution of matter is made the subject of especial study and all problems are referred back to it for their final explanations. Illustrations of the modern methods of scientific reasoning are given, and numerous practical problems, bearing on the subject in hand, are solved in and out of the class room.

II. HEAT AND ELECTRICITY. This course has been introduced especially for engineering students. The law of conservation of energy is made the fundamental principle, and the relations and effects of the various qualities are ex-

plained upon this basis. The mechanical equivalent of these forms of energy and the processes of transformation from one form to another, and problems involving this principle, are made prominent features.

III. ELEMENTARY MECHANICS. This involves an elementary consideration of the composition and resolution of forces, the measurement of forces, dynamics, hydrostatics, and pneumatics, supplemented with numerous problems selected from probable occurrences in the construction of buildings and machinery.

IV. PHYSICAL LABORATORY work includes measurements in heat and electricity.

V. ADVANCED PHYSICS. Heat, steam engine, steam boilers, electricity, elements of mechanism, and other courses in higher and applied physics are described under Civil and Mechanical Engineering.

POLITICAL SCIENCE.

PROFESSOR TANNER.

I. CIVIL GOVERNMENT AND COMMERCIAL LAW. A study is made of the township, county, municipal, state, and national government, showing the evolution of the higher from the lower forms, with especial attention to the origin of each form. The recent interpretations of the national constitution are also considered. Cooley's *Constitutional Law*.

II. POLITICAL ECONOMY. Three recitations a week from Mac Vane's *Political Economy* are supplemented by illustrative statistics, explanations and assigned readings. Original research and discussion are encouraged so as to give reality and interest to the consideration of the economic problems that now engage the highest thought of the country.

VETERINARY SCIENCE.

ASSISTANT PROFESSOR MERRILL.

This subject embraces a series of lectures, which are delivered five times a week throughout the second and third terms in both courses in agriculture. No attempt is made to turn out veterinarians in any sense of the word, but simply to give the student of agriculture such an elementary knowledge of veterinary medicine as will enable him to treat some of the commoner and simpler forms of disease, to avoid dangerous exposure of the animals under his care, and to recognize the importance of strict attention to the hygiene of his farm animals. The following is a short synopsis of the work:

I. ANATOMY OF THE HORSE. This subject is studied in the following order during the winter term—Osseous system, muscular system, digestive system, respiratory system, urinary system, vascular system, nervous system, organs of generation.

II. MATERIA MEDICA. During the spring term general pathology, therepeutics and surgery receive attention. During this term also one or more horses are dissected.

III. SPECIAL PATHOLOGY and therapeutics (contagious and infectious disease) and principles of horse shoeing are discussed.

MANUAL TRAINING DEPARTMENT.

MECHANIC ARTS COURSE.

By means of a recent appropriation by the Legislature of Utah, the College now offers a three years' Course in Mechanic Arts. The object of the course is to afford students adequate training in the use of hand and machine tools, and to fit them for industrial pursuits as proficient carpenters, smiths, machinists, or founders. The work will be made thorough and systematic. In the assignment of exercises their application to practical constructions is constantly borne in mind. Proficient workmen are engaged on the teaching staff, and instruction is given by illustrative processes rather than by verbal explanation. Accuracy and neatness are insisted upon in the making of even the most trivial articles, thus inducing both dexterous manipulation and mental discipline.

The arrangement of the course is such that all students entering it are required to take a considerable amount of woodworking and some forging and machine work; and opportunity is afforded to specialize in any of the four branches after the first year. Considerable attention is given to hand tool work, which in all cases precedes machine tool work. Free hand drawing and mechanical drawing are taught throughout the course and are made prominent features.

Besides the strictly technical work, the course affords two recitation hours a day in the classes of English, history, elementary mathematics, physics, and other general studies.

At the completion of the course the student will be given a certificate according to the rules of the College.

The work in foundry, electric welding and brazing will not be given this year.

EQUIPMENT. The shops are already supplied with the following apparatus and machinery.

For Wood Working. Twenty-four carpenter's benches with the usual sets of tools, seven wood turning or pattern maker's lathes, one jig-saw, one wood-planer, one band-saw, one universal saw-table.

For Iron Work. Twenty-four power blast forges with anvils and tool accompaniments, seven vise-benches, two 17-inch engine lathes, one speed lathe, one Brainard universal milling machine, one large vertical drill press, one large planer.

General: Emery wheels, grinding stones, special tools, etc.

STUDIES IN MECHANIC ARTS MANUAL TRAINING COURSE.

FIRST YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Grammar 5	Grammar and Composition 5
Arithmetic 5	Arithmetic 5	Arithmetic 5
Freehand Drawing . 3	Freehand Drawing . 3	Freehand Drawing . 3
Shop work 20	Shop work 20	Shop work 20
Sawing, Ripping, Planing, Mortising, Joining.	Care and adjustment of tools, Paneling, Sashes, etc.	Dovetailing and Cabinet making.

SECOND YEAR.

Geography 5	Reading 5	U. S. History . . . 5
General History . . 5	Penmanship 2	Penmanship 2
Mechanical Drawing 3	Mechanical Drawing 3	Reading 2
Shop work 20	Shop work . . . 20	Mechanical Drawing 3
1. General Forging, Welding Iron, Iron Tools 20	1. Iron and Steel Welding, Tempering, Tool making 10	Shop work 20
or	2. General Forging in Iron, Pattern making 10	1. Screw Cutting, Plumbing, Chipping, Filing and Hand Fitting.
2. Wood Turning, Machine Work in Wood 20		or
		2. Design and Construction of a Wooden Frame House.

THIRD YEAR.

Algebra 5
Grammar 5
Elective 5
Shop work 20
1. Machine Shops 20
or
2. Inside Work of House 20
or
3. Horse Shoeing, Foundry . . . 20

Algebra and Geometry 5
Rhetoric 5
Physics (Ag. Sh. course) 5
Shop work 20
1. Machine Shops 20
or
2. Stair Building . 20
or
3. Brazing, Electric Welding, Special Mouldings . . . 20

Geometry 5
Literature 5
Elective 5
Shop work . . . 20
1. Construction and Design.

Each student in this term will make some elaborate article of furniture or machinery in the branch in which he has specialized. The work must be original in selection and design, subject to approval of department staff.

DOMESTIC ARTS COURSE.

1. HOUSEHOLD ECONOMY. This course of two years is offered for the benefit of those young women who do not wish to take the studies of the regular college course but desire to devote more time to the subjects of especial interest to women. Such other studies as the student is qualified to pursue may, with the consent of the faculty, be substituted for those offered in this course.

2. FRUIT WORK includes canning fruit by various methods, steaming, sealing with wax and cotton batting; various methods of making jelly from green as well as from ripe fruits; methods of covering jelly; making pickles, spices, fruits, ketchups and meat relishes; making preserves, jams and candied fruits; preparing fruit juices, cordials and syrups.

3. MEATS, SOUPS, ETC. In this the student receives instruction in selecting different cuts of meats and in the methods of cooking best adapted to them. Practice is given in roasting, braizing, broiling, in stews and pot roasts; in preparing fowls for cooking and in making dressings; in

boning, larding and skewering; in making croquettes, scallops, etc.

Instruction is given in preparing soup stocks, in making cream soups, vegetable soups and purees.

Students are taught to prepare sauces suited to different kinds of meats and to make various meat pies, dumplings for stews and noodles for soups.

4. YEAST AND BREAD MAKING includes the making of various kinds of yeast, salt rising, wet and dry yeast; white and graham bread, corn bread, Boston brown bread; many varieties of rolls and buns.

This work includes instruction in making baking powder and in making a great variety of the breakfast breads in which it is used; biscuits, muffins, gems, Johnny cake, pancakes and waffles.

5. PASTRY COOKING includes practice in a variety of layer and loaf cakes, sponges, cream puffs, cookies, jumbles and fancy cakes, plain pastry, puff paste, tarts, patties, etc. The student is also given practice in a great variety of baked, boiled and steamed puddings; custards, blancmanges, whips, creams, jellies, etc. Instruction is given in laying tables for dinner and lunch parties, and in waiting on tables. A few lessons are given in making taffy and sugar candies with French cream fondant. Instruction is given in cooking vegetables and serving dinners during both winter terms.

6. DAIRYING. This subject will be treated mainly from the home dairy standpoint, though opportunity will be given for more extended practice to any who desire it. The aim will be to dwell particularly upon the practical phase of the subject, both in the lectures and in the work in the dairy rooms. A careful study will be made of milk, its production and composition, and the care that must necessarily be bestowed upon it as an article of food, or if it is to be manufactured into butter or cheese.

Students will have ample opportunity to get an under-

standing of the art of butter-making. Milk will be creamed by different methods, and the product will be under the care of the students till it is made up ready for market.

In cheese-making an understanding will be given of the best factory methods, but more attention will be bestowed upon the manufacturing of small cheese, such as could be made up in a few hours at the home.

II. SEWING.

The object of this course is to qualify for a trade, and to lay a foundation whereby young women may be enabled to maintain themselves.

1. HAND STITCHES. The work begins with hand sewing which consists of practice in the various stitches used in muslin and woolen goods; running, hemming, overhanding, overcasting, felling, gathering and stroking gathers, buttonholes, gusset, patching and darning, backstitch, basting, bands, bias cutting, blanket stitch, slip stitch, herring bone, chain and cross stitch and feather stitch, French hem, French seam, etc.

2. CARE OF MACHINES AND MACHINE SEWING. Regular practice is given in the care of the machine, and its mechanism is illustrated. Practice is given in running, hemming, tucking, ruffling, puffing, binding, etc.

3. CUTTING AND FITTING. The student learns to draft from measurements patterns of basques, skirts, sleeves, princess gowns, French coats, capes, circulars, etc.

4. PLAIN DRESSMAKING. Plain gowns are drafted, cut and basted, fitted, draped, trimmed and entirely finished by the student.

5. DRESSMAKING, DESIGNING AND FINISHING. Instruction is given by talks on grace in design and costume, and harmony of color. Special attention is given to draping, finishing, and the designing of costumes.

6. FANCY WORK. This consists of hemstitching, drawn work, Kensington embroidery, Roman cut work, Spanish laid work, jeweled embroidery, Bulgarian embroidery and modern lace making.

MANUAL TRAINING IN DOMESTIC ARTS.

FIRST YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Grammar 5	Grammar 5
Reading 5	U. S. History . 5	U. S. History . . . 5
Drawing 6	Cooking Lectures . 5	Drawing . . . 4
Hand Stitches . . 10	Care of Machines and Machine Sewing 10	Cutting and Fitting 10
Laundrying 4	Cooking of Meats, Soups, Sauces and Vegetables . . . 5	Yeast and Bread Making, Plain Pastry Cooking . 6

SECOND YEAR.

Arithmetic 5	Arithmetic 5	Arithmetic and Algebra 5
Geography 5	Elocution 5	Grammar 5
Plain Dress Making 10	Hygiene and Household Sanitation . 5	Dairying 10
Fruit Work 10	Designing, Draping and Finishing . 10	Fancy Work . . . 10
	Pastry Cooking, Salads, Ices etc . . . 5	

PREPARATORY DEPARTMENT.

Many of the settlements of Utah have barely passed their pioneer days. From such sections no great advance in education could be expected, and in some, the schools are quite primitive. As a consequence many young men and women, who have had to work hard with their parents in the varied operations of home making, find themselves without the educational start which their integrity merits. They have given their time to the material progress of the State, and now feel that they are entitled to a share of the intellectual advancement. In some of the thinly populated districts, schools are not regularly kept, and those that are, do not provide instruction generally adapted to the age and wants of the class referred to. It therefore seems obvious, that until these young people pass the time they may devote to school, justice demands some provision for them in our higher educational institutions. The College maintains a department for such students and offers them the following studies:

SUB-FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Grammar 5	Grammar 5	Grammar and Composition 5
Arithmetic 5	Arithmetic 5	Arithmetic and Algebra 5
Geography 5	U. S. History . . . 5	U. S. History . . . 5
Reading 2	Reading . . . 2	Reading and Declamation 3
	Afternoon Work.	
Penmanship 5	Penmanship 5	Penmanship 5
Drawing 5	Drawing 5	Drawing 5

WINTER COURSES.

I. FARMERS' COURSE. Beginning in January, a course of special lectures on agricultural subjects is given for the benefit of any farmer that may wish to attend. The course includes agriculture, horticulture, entomology, botany, chemistry, veterinary science, and dairying, treated almost wholly from the practical side, and occupying one term till the end of March. A special circular describing this course will be mailed upon application.

II. WOMEN'S COURSE. A special course in sewing, household management, cooking, and such literary or scientific studies in addition thereto as the student is prepared to pursue, is offered to women during the winter term. Special circulars describing this course will be issued.

EXAMINATIONS.

Instructors keep a record of recitations, marked according to the decimal system. In making up final examination percentages, this is counted one-third, the mid-term examination one third, and final examination for the term, one-third. But students who have been in a class only four-fifths, or less, of a term (or whose absences amount to one-fifth or more of the term) shall pass the whole subject on examination. In all four year courses, an average standing of not less than 75 per cent., with no grade less than 60 per cent., will be required for graduation. Any student falling below 60 per cent. for a month may be dropped from the class.

ADMISSION TO ADVANCED STANDING.

Students of this College, or of any similar institution, who are desirous of being admitted to advanced standing must present themselves for examination in the required subjects on the Monday and Tuesday of the week in which the College opens in the fall term.

GRADUATION.

The degree of Bachelor of Science is conferred upon completion of any of the four year courses. A certificate is granted for the completion of the Short Courses in commercial branches, or domestic arts.

COLLEGE CHARGES.

Tuition is free. An entrance fee of $5 is charged for each year of the college course; for a single term $2.50. The privileges of the library and museum are free to students. In the chemical laboratory, work shops and cooking rooms, students are charged for the cost of the materials actually used by them in their exercises, the cost varying from $2 to $4 per year in each industrial or laboratory course.

Certificate of graduation in short course, $2.50.

Bachelor of Science diploma, $5.

BOARDING HOUSE.

The Boarding House will be used for lady students exclusively, and will be under the discipline of the College. Students will be responsible to the president for their conduct, and will not be allowed out evenings without the consent of the matron, who will make a monthly report to the president of each lady's conduct and absences in the evenings after regulation hours.

Two students usually occupy one room, the cost to each for room, electric light, and board being from $2.25 to $2.50 a week. Students at the above prices furnish bedding and carpet. Furnished rooms may be had for $2.75 a week.

LIBRARY.

MRS. GOODWIN, Librarian.

The general library contains about five thousand volumes and several thousand pamplets. The subjects covered are general literature, including poetry and fiction, travel, history, biography and criticism; political economy, sociology, metaphysics, general science, and such of the special sciences as are included in the courses of the several departments. The Professor of English Literature, whose private library contains about two thousand eight hundred volumes, allows to advanced students in his own classes, the privilege of the use of his library under his direction. Some of the other professors also accord access to their private libraries as occasion may require. The library and reading room are open to the students and to the general public every college day throughout the year.

The list of periodicals placed in the reading room upon subscription is as follows:

LITERARY MAGAZINES.

Atlantic Monthly.
Book News.
Century.
Cosmopolitan.
Critic.
Dial.
Edinburgh Review.
Education.
Educational Review.
Forum.
Gentlewoman.
Harper's Bazar.
Harper's Monthly.
Harper's Weekly.
Journal of Education.
Ladies' Home Journal.
Literature.
Literary Digest.
Literary World.
McClure's Magazine.
Munsey's Magazine.
Nation.
North American Review.
Outlook.
Review of Reviews, Am. Ed.
Scribner's Magazine.
Student's Journal.
The Argosy.
University Chronicle.
University Magazine.
Youth's Companion.

SCIENTIFIC AND TECHNICAL MAGAZINES.

American Machinist.
American Magazine of Civics.
American Journal of Politics.
American Naturalist.
Architectural Record.
Art Education.
Art Journal.
Delineator.
Dietetic Magazine.
Electrician.
Engineering Magazine.
Etude.
Good Housekeeping.
Home Art.
Housekeeper.
Johns - Hopkins' University Studies.
Journal of American Folk Lore.
Journal of Association of Engineering Societies.
Journal of Veterinary Archives.
Le Bon Temps.
Library Magazine.
Machinery.
Modern Art.
Music.
Nature.
Penman's Journal.
Political Science Quarterly.
Popular Science Monthly.
Public Libraries.
Sanitarian.
School Review.
Science.
Scientific American — Building Edition.
Scientific American — Supplement.
Studies in Historical and Political Science.
Table Talk.
Transactions of American Society of Mechanical Engineering.
Werner's Voice Magazine.

AGRICULTURAL MAGAZINES.

Agricultural Science.
American Bee Journal.
American Gardening.
Breeder's Gazette.
Country Gentleman.
Farm Poultry.
Journal of Horticulture.
Pacific Rural Press.
Poultry World.

NEWSPAPEPERS AND MISCELLANEOUS PERIODICALS.

The folowing is a list of periodicals received at the Experiment Station library, through the courtesy and liberality of the publishers, in exchange for the publications of the Station. Free access to these and other publications is allowed to college students and to the general public. The list comprises nearly all the best agricultoral papers of the

country, and in connection with the college list of periodicals, constitutes an excellent current library of agriculture and related sciences.

Agricultural Epitomist.
Agriculturalist.
American Agriculturist, Middle and Western editions.
American Creamery.
American Cultivator.
American Fertilizer.
American Gardening.
American Grange Bulletin.
American Horticulturist.
American Poultry Journal.
American Sheep Breeder and Wool Grower.
American Swineherd.
Baltimore Weekly Sun.
California Cultivator and Poultry Keeper.
California Fruit Grower.
Chroniqe Agricole, Lausanne, Switzerland.
Clover Leaf.
Colman's Rural World.
Commercial Agriculture.
Connecticut Farmer.
Creamery Journal.
Cultivator.
Daily Public Ledger, Philadelphia.
Dairy The, London, England.
Dairy World.
Dakota Farmer.
Elgin Dairy Report.
Farmers' Advocate.
Farm, Field and Fireside.
Farm and Fireside.
Farmers' Guide.
Farm and Home.
Farmer's Home.
Farmer's Journal.
Farmer's Call.
Farmer's Magazine.
Farming, Toronto, Ontario, Canada.
Farm News.
Farm and Orchard.
Farmers' Review.
Farm, Stock and Home.
Field and Farm.
Gardening.
Grange Visitor.
Hoard's Dairyman.
Holstein Friesian Register.
Hospodar.
Illustrated London News.
Indiana Farmer.
Industrial American.
Industrialist.
Irrigation Age.
Journal of Board of Agriculture, London, England.
Journal of Agriculture.
Jersey Bulletin.
Kansas Farmer.
Live Stock Indicator.
Live Stock Report.
L'Industrie Laitiere, Paris, France.
Louisiana Planter.
Milch Zeitung, Bremen, Germany.
Mirror and Farmer.
Montana Fruit Grower.
Nebraska Farmer.
Neue Zeitschrift fur Rubenzucker - Industrie, Berlin, Germany.
New England Farmer.
New England Florist.
Ohio Farmer.
Orange Judd Farmer.

Pacific Coast Dairyman.
Pacific Rural Press.
Practical Farmer.
Prairie Farmer.
Reliable Poultry Journal.
Revue Internationale des Falsifications, Amsterdam, Holland
Rural Canadian, Toronto, Ontario, Canada.
Rural Life.
Rural Northwest.
Scottish Farmer, Glasgow, Scotland.
Southern Cultivator.
Stockman and Farmer.
Successful Farmer.
Sugar Beet.
Texas Farm and Ranch.
Ulster Agriculturalist, Belfast, Ireland.
Wallace's Farmer.
Weekly Call, San Francisco.
Weekly Tribune, New York.
Western Agriculturist and Live Stock Journal.
Western Rural.
Wisconsin Agriculturist.
Wool, Mutton and Pork.
World, thrice a week.

The following Utah newspapers are also sent by the courtesy of the publishers.

Advocate, Price.
Advocate, Richfield.
American, Spanish Fork.
Banner, Lehi.
Beobachter, Salt Lake City.
Blade, Deseret.
Box Elder News, Brigham.
Bugler, Brigham.
Bulletin, Bingham.
Independent, Sandy.
Independent, Springville.
Inter-Mountain Advocate, Salt Lake City.
Item, American Fork.
Journal, Logan.
Mercury, Mercur.
Messenger, Manti.
Miner, Tintic.
Nation, Logan.
News, Beaver.
Press, Ogden.
Progress, Fillmore.
Pyramid, Mount Pleasant.
Record, Cedar City.
Clipper, Farmington.
Democrat, Eureka.
Deseret News, Salt Lake City.
Enterprise, Ephraim.
Enquirer, Provo.
Express, Vernal.
Globe, Payson.
Herald, Salt Lake City.
Improvement Era.
Record, Park City.
Republic, Nephi.
Review, Ogden.
Round-up, Randolph.
Sentinel, Manti.
Southern Censor, Richfield.
Standard, Ogden.
Times, Coalville.
Transcript, Tooele.
Tribune, Salt Lake City.
Utah Patriot, Park City.
Utonian, Provo.
Wasatch Wave, Heber.
Woman's Exponent.
Young Woman's Journal.

MUSEUM.

_____, Curator.

The Museum contains a considerable number of specimens illustrative of Geology and Palæontology, Vetebrate and Invertebrate Zoology, Mineralogy; also about four thousand five hundred species of the Rocky Mountain flora, and a large number of the woods of the United States. There is also an extensive collection of grains representing the produce of Utah and other States. A small collection of Indian and Polynesian products and curiosities has been made.

Donations to the Museum will be highly appreciated.

The following contributions have been made to the Museum and are hereby thankfully acknowledged:

Mr. J. W. Dunn, Frisco, Utah.—Cerargyrite and gypsum from Horn Silver Mine, Frisco, Utah.

Prof. E. S. Richman, Fullerton, California.—Petrified wood, Obsidian formation, Castle Geyser formations, Fountain Geyser formations, Hot Springs formations; all from Yellow Stone Park.

Mr. T. C. Craigan, Logan.—Petrified wood.

Mr. Lewis Carver, Plain City.—Asbestos and petrified wood.

Mr. F. M. Staker, Rockport, Utah.—Mineralogical specimens.

Mr. T. R. Welsh, Croydon, Utah.—Ammonites from Somersetshire, England.

Mr. A. G. Watson.—Crystalized lead from Keynote Mine, Bingham Canyon.

Mr. Charles Blyth, Salt Lake City.—Ute Indian spear heads and peace pipe from Uintah Reservation.

Mr. A. L. Green, Menan, Idaho.—Collection of shells, coral, seaweeds, curios, cloth and mats woven by the natives. All from the Samoan Islands.

Mr. S. P. Morgan, Logan.— Specimen plant of peanuts grown in southern Idaho, near Franklin.

Mr. Theodore Martineau, Colonia, Juarez, Mexico.—Collection of ancient pottery from Mexico.

Prof. J. T. Miller, Nephi, Utah.—Collection of Coins of various nations.

Mr. Alma Green, Menan Idaho.—Shells, coral moss, and photographs from Samoan Islands.

Mr. J. R. Thompson, Richmond.—Lime incrustations, Soda Springs, Idaho.

Mr. Samuel Littledale, Smithfield.—Curio.

Mr. Henry Bassett, Salt Lake City.—Indian arrow head.

Mr. Christian Fonnsbeck, Newton District.—An anatomical monstrosity.

Mr. H. C. Hansen, Logan.—Specimens of curly ash and curly maple from Virginia.

WEATHER FORECASTS.

The College receives the telegraphic weather forecasts from the forecast official of the Department of Agriculture located at San Francisco. The forecasts are telegraphed each day (Sundays and holidays excepted) at government expense. The signal flags are displayed from the flagstaff of the College in full view of the valley below. These forecasts or warnings are of great value to the farming community. In 1893 the percentage of verification of the forecasts of the Pacific Coast division was 83.7. For Utah, which is part of this division, the percentage was likewise 83.7. Great value is placed upon these forecasts by the Department of Agriculture at Washington. From their timely warnings much property is saved both on sea and land. The Department considers that $10,000,000 is a con-

servative estimate of the value of property saved in 1895. Doubtless some means will be devised in the near future whereby these forecasts will be made more accessible to the farming community. An explanation of the flag signals is shown on the third page of the cover.

CATALOGUE OF STUDENTS.

POST GRADUATES.

Foster, Clara ..... Logan.
Hart, Hermoine ..... Bloomington, Idaho.
Jenson, Charles A..... Hyrum.
Lundberg, Victoria..... Providence.

SENIORS.

Atkinson, Frederick Henry ..... Dayton.
Beers, Anna ..... Logan.
Bullen, Mabel ..... Richmond.
Harris, Joel J. ..... Ogden.
Irvine, Alexander Ray ..... ~~Logan.~~ Salt Lake city

JUNIORS.

Baker, John Simon ..... Mendon.
Beers, William Duke ..... Logan.
Gordon, Robert John..... ~~Meadowville.~~ Salt Lake city
Hansen, Niels M..... ~~Logan.~~ Salt Lake city
Peterson, Joseph Hogan ..... Huntsville.
Peterson, William..... Bloomington, Idaho.
Simmonds, William Walter ..... ~~Trenton.~~ Salmon city Idaho.
Stover, Arthur Petterson ..... Logan.

SOPHOMORES.

Bithell, Joseph J..... Salt Lake City.
Webb Bullen, Ethel ..... Richmond.
Christianson, John Frederick..... Ephraim.

Cooper, Blanche ..... ~~McCammon, Idaho.~~ Salt Lake city
Curtis, Harry Benson..... Blackfoot, Idaho.
Davis, Arthur James ..... Salmon City, Idaho.
Eliason, Peter William ..... ~~Moroni.~~ Logan
Flemming, Burton Percival ..... Logan.
Hogensen, Christian..... Newton.
Johanson, Oscar ..... Idaho Falls, Idaho.
Jensen, Joseph William..... ~~Newton.~~ Ray
Maughan, Elizabeth Collins..... Peterboro.
Merrill, Fred Whitmore ..... Richmond.
Shepard Miner, Idalah..... Logan.
Nelson, William ..... Newton.
Nelson, Ethel..... Manti.
Ralph, Fred Charles ..... Hyrum.
Smith, Parley Franklin..... Lewiston.
Stevens, David..... ~~Malad, Idaho.~~ Moro Oregon
Stone, Ellen Anne ..... Fullerton, Cal.
Taylor, George Francis..... Plain City.

FRESHMEN.

Anderson, Gustave Edwin ..... Lehi.
Anderson, John Amos..... Rexburg, Idaho,
Baldwin, Nathaniel..... Fillmore.
Bench, Ella Maria..... Manti.
Boley, Warren Chipman ..... American Fork.
Borlase, John Albert ..... Bingham Junction.
Brown, Charles Franklin..... Loa.
Bullen, Blanche ..... Richmond.
Christensen, Mary Ida..... Hyrum.
Christensen, Amelia Mary Ann..... Soda Springs, Idaho.
Cowley, David ..... Logan.
Crane, Bert..... Soda Springs, Idaho.
Crawford, Bertha ..... Manti.
Crawford, Catherine Ann ..... Manti.
Crawford, Stanley..... Manti.
Evans, Esther ..... Malad, Idaho.
Foster, Elizabeth Curtis ..... Logan.

Fisher, Minnie.....Oxford, Idaho.
Fisher, Stella Josephine .....Oxford, Idaho.
Howell, William Maughan .....~~Wellsville.~~ Salt Lake city
Hodgman, Bruce William.....Hailey, Idaho.
Hart, Emily Rosena.....Bloomington, Idaho.
Hendricks, John William .....Richmond.
Hendricks, William Warren.....Richmond.
Hillman, William Henry.....Oxford, Idaho.
Hines, Frank Thomas .....Salt Lake City.
Irvine, Robert Leo .....Logan.
Jensen, John Henry .....St. Charles, Idaho.
Jones, Franklin Morgan .....Malad, Idaho.
Kirkbride, James William.....Smithfield.
Larson, David .....Collinston.
Larson, John William.....Collinston.
Larson, Nellie Marie .....Logan.
Madson, Antoinette .....Manti.
McAlister, Maima.....Logan.
McDonald, Mary Elizabeth .....Salmon City, Idaho.
Merrill, Charles William .....Brigham.
Miller, Elizabeth.....Alma, Wyoming.
Morgan, George Lester.....Paris, Idaho.
Morgan, John Richard.....Willard.
Morgan, Samuel Perry.....Franklin.
Neeley, Parley Hughes .....~~Kamas.~~ Coalville
Nelson, Charles Walter.....Richmond.
Nelson, Edna Louie.....Fish Haven, Idaho.
Olsen, Aaron Brigham .....Logan.
Ormsby, Mabel Jane .....Logan.
Brown Perry, Mary Almeda .....Vernon. Logan
Peterson. Anna .....Bloomington, Idaho.
Porter, Charles Walter .....Porterville.
Porter, Moses Ensign .....Riverside.
Porter, Tillie, Mrs.....Riverside.
Pratt, Nettie .....Oxford, Idaho.
Pugmire, Rich .....St. Charles, Idaho.
Pulley, Edward Parley .....~~American Fork.~~ Logan
Redford, John .....Beaver Canyon, Idaho.

Redford, Hyrum.....Beaver Canyon, Idaho.
Rich, William Lafayette.....Paris Idaho.
Rigby, Alma Liptrot .....Hooper.
Saucier, Fred Erwin.....San Jose, California.
Seegmiller, William West.....Upper Kanab.
Skeen, Jedediah.....Plain City.
Stewart, Robert .....Plain City.
Stewart, Frank.....St. Charles, Idaho.
Stover, Mattie Eva.....Logan.
Sullivan, Julia .....Grace, Idaho.
Tanner, Arthur Leroy .....Logan.
Tenney, Levi Stewart .....Colonia, Diaz, Mexico.
Thatcher, Franklin Davis.....~~Logan~~. Ogden
Thomas, Burton Lewis .....Bloomington, Idaho.
Thornock, Joseph Emanuel.....Bloomington, Idaho.
Twelves, Murray .....Provo.
Warner, William David.....Uintah.
Wheatley, John Gibbs .....Honeyville.
Wheeler, Oliver Prentice .....Blackfoot, Idaho.
Whitmore, John Wiley .....Nephi.
Young, Wilford Van Cott.....Salt Lake City.

SPECIALS.

Beveridge, William.....Alma, Wyoming.
Bingham, William David .....Brigham City.
Curtis, Mrs. Geo. W. .....Washington, Louisiana.
Davis, Emma.....Soda Springs, Idaho.
Evans, David.....Anaconda, Montana.
Fisher, George Howard .....Oxford, Idaho.
Fisher, Laura Lewis, Mrs.....Oxford, Idaho.
Fjelsted, Estella .....Logan.
Gibson, Ella.....Smithfield.
Greaves, John C. W.....Preston, Idaho.
Hansen, Selma.....Smithfield.
Hoff, Beatrice .....Georgetown, Idaho.
Kimball, June Ethel.....Salt Lake City.
Law, Joseph Paxton.....Paradise.

May, Marion.....Honeyville.
Miner, Florence .....Logan.
Nebeker, Clara.....Laketown.
Olsen, Frederic Christian.....Preston.
Petersen, Carry .....Ephraim.
Rencher, Wm. David.....Springerville, Arizona.
Rainey, Jennie Bell .....Richmond.
Ream, Nora Ellen, Mrs.....Dingle, Idaho.
Rice, Jennie .....Elna, Idaho.
Rich, Libbie.....St. Charles.
Robinson, Mary Elizabeth.....Farmington.
Schaub, Karl Conrad.....Logan.
Scott, Catherine .....Oxford, Idaho.
Tanner, Arthur Leary .....Logan.
Thomas, Maria, Mrs.....Logan.
Welker, Clara .....Bloomington, Idaho.
West, Matey .....Pocatello, Idaho.

DOMESTIC ARTS—MANUAL TRAINING.

Beveridge, Ida.....Almy, Wyoming.
Bunot, Myra .....Hennefer.
Bush, Barbara Marie .....St. John.
Cohn, Emma .....Oneida, Idaho.
Davis, Grace.....Idaho Falls, Idaho.
Groesbeck, Abby.....Springville.
Hendricks, Amy .....Richmond.
Larson, Eliza.....Collinston.
Larson, Victoria .....Collinston.
Mattson, Amanda.....Logan.
Nebeker, Naomi .....Lake Town.
Nelson, Blanche .....Fish Haven, Idaho.
Paine, Veanetta .....Georgetown, Idaho.
Selk, Benia.....Dingle, Idaho.
Thomas, Fenretta.....Smithfield.

MECHANIC ARTS—MANUAL TRAINING.

Anderson, Albert William .....Meadow.
Anderson, Hyrum.....Bear River City.

Anderson, John Edward ..... Meadow.
Andersen, Nils Peder ..... Logan.
Allred, Ernest ..... Fairview.
Allred, Myron ..... Spring City.
Allred, Samuel Willis ..... Spring City.
Arnett, William ..... Boise, Idaho.
Asplund, William Joel ..... Fairview.
Bacon, Delos ..... West Jordan.
Baker, Lyman ..... Mendon.
Barson, Denny Birdell ..... Clarkston.
Bell, Adelbert ..... Logan.
Bone, John Edwin ..... Lehi.
Brown, Carl Louis ..... Scipio.
Brown, James C ..... Farmington.
Brown, Joel Thomas ..... Loa.
Brown, William ..... Scipio.
Bywater, James Alfred ..... Brigham City.
Call, William Wiley ..... Castle Dale.
Campbell, Jared Edward, Jr ..... Soda Springs, Idaho.
Cox, Roy B ..... Fairview.
Ferguson, John Thomas ..... Meadow.
Fowler, George ..... Hennefer.
Grundy, Marion ..... Loa.
Grundy, William Jefferson ..... Loa.
Hague, Jay Henry ..... Cannon.
Haguewood, Walter Marshal ..... Salt Lake City.
Hancock, George Arthur ..... Downey.
Haight, George Hector ..... Farmington.
Hansen, Herbert Erastus ..... Fairview.
Hansen, James Peter, Jr ..... Spring City.
Hansen, Joseph Henry ..... Logan.
Hansen, Tersy ..... Bear River City.
Heileson, Neils Christian ..... Glenwood.
Heppler, John ..... Glenwood.
Jeffs, William Arthur ..... Castle Dale.
Jones, Edward Thomas ..... Spanish Fork.
Jones, Hyrum Erastus ..... Clear Creek.

Kimball, Arthur .....Logan.
Kimball, Richard Hopkins.....Logan.
Lallis, Charles James.....Mendon.
Lamb, James Hanmer .....Coalville.
Larsen, Rasmus Christian.....Ephraim.
Leigh, William Henry.....Cedar City.
Lewis, Robert Thomas .....Logan.
Linford, James Wesley .....St. Charles, Idaho.
Linford, John Amasa.....Garden City.
Madsen, Niels Peter.....Fountain Green.
Magleby, Heber Lorenzo .....Monroe.
Marble, Edward Horace.....Deweyville.
McCulloch, Oliver .....Logan.
Memmott, Edgar.....Scipio.
Monson, Niels Ludwig .....Pleasant Grove.
Myers, John Ephraim, Jr .....Panguitch.
Naegle, James .....Toquerville.
Nielson, Amos Lampe.....Honeyville.
Nostrom, Martin.....Fairview.
Olsen, Otto Hans .....Preston, Idaho.
Peart, Joseph .....Richmond.
Peterson, Carl Gustave .....Richmond.
Robinson, Arnold.....Richmond.
Scott, John William E.....Millville.
Somsen, Frank.....Cokeville, Wyoming.
Somsen, Henry Samuel.....Cokeville, Wyoming.
Sweeten, George Gillis .....Mendon.
Tanner, Henry Call .....Payson.
Taylor, William.....Fairview.
Terry, Charles Alphonzo, Jr.....Fairview.
Webb, Bernard Graham.....Lehi.
Webb, Frederic Mark .....Lehi.
Weekes, William Henry .....Lima, Idaho.
Woodall, Demas Alexander.....Soda Springs, Idaho.
Woodall, James Franklin .....Soda Springs, Idaho.

SUB-FRESHMEN.

Adams, George Henry ..... Layton.
Adams, Hugh Robert ..... Logan.
Adams, Hyrum Rufus..... Layton.
Adams, Isaac Joshua ..... Layton.
Adams, Lilly May ..... Layton.
Adams, Rufus William..... Layton.
Adams, Samuel Joseph ..... Layton.
Ames, Henry Baxter..... Wellsville.
Anderson, Lovina..... Hyrum.
Ashcraft, Rosa Dale ..... Smithfield.
Baker, Lettie ..... Mendon.
Barber, Sarepta..... Logan.
Barnard, Allen..... Deer Lodge, Montana.
Barrack, James Edward..... Salmon, Idaho.
Barson, Ellen..... Clarkston.
Bassett, Charles Julius, Jr..... Blackfoot, Idaho.
Bennett, Calvin..... Gentile Valley, Idaho.
Bennett, Frank David..... Idaho Falls, Idaho.
Boley, Henry Chipman..... American Fork.
Brewer, William ..... St. Charles, Idaho.
Briggs, William Amos..... Lewisville, Idaho.
Brooks, Harry Ray ..... Butte, Montana.
Bunderson, James..... St. Charles, Idaho.
Bunot, Henry ..... Hennefer.
Bush, John Paul ..... Logan.
Bush, Richard Leroy..... St. John.
Caine, John Thomas, Jr..... Logan.
Candland, Lawrence..... Uinta.
Carlisle, Benjamin ..... Logan.
Carlson, Ezra..... Logan.
Chambers, Seth..... Smithfield.
Christensen, Annie..... Newton.
Christopherson, Peter Williamson.. Soda Springs, Idaho.
Clark, Hazle ..... Manti.
Cohn, Max ..... Oneida, Idaho.
Cole, Horatius..... Willard.

Collett, Burt.....Cokeville, Wyoming.
Collins, Arthur .....Lago, Idaho.
Collins, Henry Ferguson .....Lago, Idaho.
Collins, Libbie Bess.....Lago, Idaho.
Dahle, Albert H.....Logan.
Davis, Daisy Dean .....Soda Springs, Idaho.
Davis, Hannah.....Idaho Falls, Idaho.
Davis, Taylor.....Soda Springs, Idaho.
Dods, William.....Tooele.
Driggs, Lois Lenore.....Salt Lake City.
Egbert, Roy Samuel .....Logan.
Erickson, James .....Ogden.
Farnesworth, Charles.....Beaver.
Farr, Aquilla .....Logan.
Farrell, Lovine .....Logan.
Farrell, Vendla .....Logan.
Felt, Gustave .....Huntsville.
Forgeon, Mildred Lou.....Cokeville, Wyoming.
Fryar, Allen Porter .....Soda Springs, Idaho.
Fryar, Reed .....Soda Springs, Idaho.
George, Leslie .....Kanosh.
Gibbs, Adell.....Lago, Idaho.
Groesbeck, Abby .....Springville.
Groesbeck, Marion.....Springville.
Haight, Jacob.....Farmington.
Hansen, Christian James.....Collinston.
Hansen, Eugene Serverin.....Collinston.
Hansen, Therese Anna .....Pocatello, Idaho.
Hays, John William .....Dubois, Idaho.
Henderson, David Williams.....Oneida, Idaho.
Henderson, Rebecca .....Oneida, Idaho.
Hoff, Henry Herman.....Georgetown. Idaho.
Hoggan, George Ralph .....Providence.
Holdaway, David Dean.....Price.
Holmgren, Albert.....Bear River City.
Homer, William .....Trenton.
Hougaard, John Andrew.....Manti.

Humpherys, Ray Rich.....Paris, Idaho.
Hughes, Lewis, Jr.....Samaria, Idaho.
Jacobson, Christian.....Cokeville, Wyoming.
Jacobson, Julia.....Cokeville, Wyoming.
James, Henry Robert.....Logan.
Jensen, Lorenzo.....Bear River City.
Jensen, Peter .....Logan.
Jensen, Sarah Maretta .....Newton.
Judah, Thomas Nelson .....Lancaster, Kansas.
Keith, Charles Forman .....Park City.
Kirkbridge, Wesley .....Smithfield.
Kirkendall, John Richmond.....Robinson.
Knox, Franklin Chase .....Logan.
Kofford, James Arthur .....Porterville.
Larsen Junius .....Logan.
Larsen, Rasmus Christian.....Ephraim.
Larson, Andrew .....Logan.
Layton, Horace.....Layton.
Lewis, Amelia .....Dingle, Idaho.
Lewis, Edith.....Dingle, Idaho.
Lessing, Bertha.....Minersville.
Madsen, Spencer.....Manti.
Marker, Andrew .....Bay Horse, Idaho.
Maughan Alice Farnes .....Peterboro.
Maughan, Brigham Morgan.....Wellsville.
Merrill, Emma.....Richmond.
Monson, James .....St. Charles, Ihaho,
Montrose, Ray.....Logan.
Montrose, Sanie .....Logan.
Morgan, Ernest Emmit.....Logan.
Morgan, Pauline .....Willard.
Morrison, Robert Ulysses .....Boise Valley, Idaho.
Munk, Albert .....Logan.
Munk, Sophia .....Logan.
McNeil, Charles .....Logan.
Neibaur, Benjamin .....Kamas.
Nelson, Aaron Alma .....St. George.

Nelson, Clara Jane ..... Fish Haven, Idaho.
Neilson, Peter Mads ..... Pleasant Grove.
Norton, George Asa..... Stewart, Montana.
Norton, Janie Eliza ..... Stewart, Montana.
O'Brien, James Alma..... Layton.
O'Brien, William Leroy ..... Layton.
Olsen, Rudolph..... Preston, Idaho.
Osmond, Alice Maud..... Bloomington, Idaho.
Owens, Richard Evan ..... Malad, Idaho.
Parker, Henry ..... Wellsville.
Parkinson, Eva Smart ..... Franklin, Idaho.
Paxton, Frank ..... Kanosh.
Peacock, Velora..... Manti.
Perry, Hulda Orvilla ..... Vernon.
Peterson, Albert ..... Bear River City.
Peterson, Edward Larsen ..... Peterboro.
Peterson, Parley S..... Ephraim.
Peterson, Sern Peter..... Newton.
Peterson, Thyra Louise..... Hyrum.
Porter, John Riley ..... Porterville.
Porter, Moses Ensign ..... Riverside.
Price, George..... Hooper.
Prince, Joseph ..... Harmony.
Pugmire, Leroy Rich..... St. Charles, Idaho.
Quayle, William Littlefair ..... Logan.
Reese, William ..... Salt Lake City.
Rencher, Rose ..... Pine Valley.
Richins, Parley Thomas ..... Hennefer.
Robinson, Alma ..... Logan.
Robinson, Eben Jay..... Farmington.
Ronnow, Erastus..... Panacca, Nevada.
Rose, Annie Beatrice..... Soda Springs, Idaho.
Rose, Nerva Leal ..... Soda Springs, Idaho.
Rose, Walter Nowlin..... Soda Springs, Idaho.
Simister, Mary..... Coalville.
Simonsen, John Peter ..... Newton.
Smith, Alexander ..... Logan.

Smith, Charles Bailey ..... Boise, Idaho.
Smith, Joseph Alastor, Jr ..... Providence.
Smith, Rochester H ..... Preston, Idaho.
Smith, Thomas Rowland ..... Logan.
Smith, Willis Alvin ..... Lewiston.
Smout, John ..... Slaterville.
Somsen, Olive Emily ..... Cokeville, Wyoming.
Sorenson, George ..... Scipio.
Spande, Thomas ..... Logan.
Spaulding, Lewis ..... Hooper.
Speireman, Connie ..... Logan.
Standing, John Robert ..... Collinston.
Standing, Maud Eleanor ..... Collinston.
Stephens, Robert ..... Hennefer.
Stevens, Sybil ..... Montpelier, Idaho.
Stewart, James William ..... Benjamin.
Stoffers, Larona Henry ..... Cokeville, Wyoming.
Stromberg, David ..... Huntsville.
Sullivan, David ..... Grace, Idaho.
Sullivan, Helen ..... Grace, Idaho.
Sullivan, Minnie ..... Grace, Idaho.
Sutherland, James ..... Provo.
Sweeten, Mary Amanda ..... Mendon.
Swindle, Heber ..... Monroe.
Talbot, Daniel Stephen ..... Lewiston.
Talbot, George Layton ..... Layton.
Talbot, Olive Leonie ..... Lewiston.
Taylor, Appollos Benjamin, Jr. ..... Willard.
Terry, Lula ..... Logan.
Thatcher, Henry Kitchen ..... Gentile Valley, Idaho.
Thomas, Howard Lafayette ..... Smithfield.
Thomas, Thomas Robert ..... Coalville.
Thornock, John Hyrum ..... Bloomington, Idaho.
Thomason, Jennie ..... Logan.
Thompson, Alton ..... Scipio.
Tibbits, George Samuel ..... Providence.
Turner, Edward Hugh ..... Gentile Valley, Idaho.

Turner, Lillian.....Gentile Valley, Idaho.
Tuttle, Lawrence A.....Manti.
Waylett, Margaret Mabel.....Malad, Idaho.
Webb, George Oliver.....Richmond.
Webster, Francis, Jr. .....Cedar City.
Welker, Roy Anson.....Bloomington, Idaho.
West, John Thompson .....Pocatello, Idaho.
Williams, Arthur.....Peterson.
Wilson, Amy Elizabeth.....Logan.

DOMESTIC ART—SPECIAL WINTER COURSE.

Benson, Eva.....Logan.
Buhler, Cecelia.....Logan.
Bushman, June.....St. Joseph, Arizona.
Cowley, Katie .....Logan.
Knox, Eva ....Logan.
Partington, Martha.....Logan.
Spencer, Emma Rebecca .....Porterville.
Turner, May.....Logan.

MEN'S WINTER COURSE.

Adams, John Q .....Logan.
Carlson, Swen Olsen .....Logan.
Charles, John.....Logan.
Fillerup, Andrew Peter, Jr .....Lake View.
Ford, Parley.....Wallsburg.
Goldsberry, Orson Stanton .....Paradise.
Gunnarson, Joseph Nephi.....Logan.
Hatch, Abram, Jr .....Heber City.
Hone, Alma .....Benjamin.
Lau, Hyrum Moroni .....Soda Springs, Idaho.
Madsen, Hans .....Fairview.
Olsen, John .....Logan.
Partington, Joseph Alma .....Logan.
Sjostrom, Charles Caverrin .....Logan.
Sjostrom, Gustave Malcome .....Logan.
Taylor, Thomas, Jr.....Elba, Idaho.

SUMMARY OF STUDENTS.

Post Graduates	4	
Seniors	4	
Juniors	8	
Sophomores	21	
Freshmen	75	
		112
Specials	31	
Domestic Arts, Manual Training	15	
Mechanical Arts, Manual Training	74	
Sub-Freshmen	194	
Women's Winter Course	8	
Men's Winter Course	15	
		449

INDEX.

PAGE.

Admission, Requirements for 17
Admission to Advanced Standing 68
Aesthetics 42
Agriculture 19-21, 31
Agronomy 32
Algebra 53
Anatomy and Physiology 34
Analytical Geometry 54
Ancient History 33
Animal Industry 53
Argumentation 48
Artillery 57
Assaying 51

Biology 34
Board of Trustees 5
Boarding House 69
Bookkeeping 37
Botany, Structural 35
Botany, Physiological 35
Business Customs 39
Butter Making 33

Cabinet Making 55
Calculus 54
Calendar 3
Certificate of Graduation 69
Charges 69
Chemical Analysis 36-37
Chemistry 36-37
Chemistry, Agricultural 37
Chemistry, Organic 37
Cheese Making 34
Civil Engineering 23-24, 44-46
Civil Government 59
College Calendar 4
Commercial Course 26-28, 37
Commercial Calculations 39

PAGE.

Commercial Law 38, 61
Cooking, Lectures on 41
Cooking, Practice in 41
Course of Study 18-30

Dairy Husbandry 33-34
Dairying, Practical, and Factories 34
Descriptive Geometry 43
Designing, Cutting and Fitting 42, 67
Diploma 69
Directions to Students 17
Domestic Arts 24-25-26, 40
Domestic Arts, Manual Training Course 63-66
Drawing 43
Drainage 31
Dressmaking 42, 65
Dynamics of Machines 46

Electricity, Applied 43-44
Elocution 44
English Classics 48-49
English Grammar 47
English History 52
English Literature 48-49
Entomology 50
Establishment of College 8
Examinations 68
Examinations, Entrance 17
Equipment of College 12
Experiment Station Staff 5

Faculty 6-7-8
Fancy Work 42, 66
Farm Crops 32
Farm Equipments 31
Farm Fences 31
Farm Irrigation 31
Floriculture 53
Freehand Drawing 43
Fruit Work 40, 63
General Science 29-30
Geology 51
Geometric Drawing 43
Geometry, Analytical 54
Geometry, Descriptive 44
Geometry, Plane and Solid 53-54

PAGE.

German 50
Graduation 69
Graduates, List of 78
Grecian History 52

Heat and Electricity 88
History 51
History of Agriculture 31
History of College 9-12
History of Commerce 38
History of Literature 49
Holidays 4
Horticulture 52
Household Economy 40-63
Household Management 41
Hydraulics 44
Hygiene 41

Infantry 56
Irrigation 31
Irrigation Engineering 34, 44
Iron Forging 55

Laundrying 40
Library 70–73
Library, English 70
Lithology 51
Literature, English 48
Literature: Masterpieces 49
Live Stock 33
Live Stock, Breeds of; Breeding of; Management of; Judging of 33
Location of College 12

Machine Design 46
Machine Work 55
Magazines, Agricultural 71
Magazines, Literary 70
Magazines, Scientific 71
Magazines, Technical 71
Manual Training 61
Mathematics 53, 56
Meats, Soups, etc 63
Mechanic Arts 54, 55
Mechanic Arts Manual Training Course 61–3
Mechanics, Applied 46
Mechanical Drawing 43

PAGE.

Mechanics, Elementary 59
Mechanical Engineering 21–22; 45, 47
Mechanism, Elements of 45
Metallurgy 46
Meteorology 56
Military Science and Tactics 56
Milk 33
Milk Testing 33
Mineralogy 51
Municipal Engineering 45
Museum 74–75
Music 57

Newspapers and Miscellaneous Periodicals 71–73

Objects of College 16

Pastry Cooking, Desserts, and Salads 64
Pattern Making 55
Penmanship 39
Philosophy 58
Physical Culture 58
Physical Laboratory 59
Physical Measurements 59
Physics 58, 59
Physics, Advanced 59
Physics, Elementary 58
Political Science 59
Political Economy 39, 59
Pomology 53
Power Measurement and Transmission 46
Practical Bookkeeping 37
Practice in Cooking 41
Preparatory Department 67
Propagation and Pruning 52
Psychology 58

Qualitative Analysis 36
Quantitative Analysis 36

Reading 43
Reading Room 70
Rhetoric, Elementary 47
Rhetoric, Advanced 48
Roads and Pavements 45
Roman History 52
Rural Engineering 31

PAGE.
Science—General Course 29, 30
Science of Nutrition 41
Sewing 42, 64, 67
Sewing, Piece 42
Shop Practice 55
Short Agricultural Course 21
Short Commercial Course 28
Short Courses 21, 26, 28
Short Domestic Arts Course 26
Soils 32
Steam Engineering 46
Steel Forging 55
Stenography 39
Stockfeeding 32
Students, Catalogue of 77–90
Sub-Freshman Year 67
Summary of Studies 90
Surveying 44, 54

Technical Instruction 54
Thesis 45–47
Trigonometry 54
Trustees, Board of 5
Typewriting 40

United States History 67

Veterinary Anatomy 60
Veterinary Materia Medica 60
Veterinary Pathology 60
Veterinary Science 60
Vise Work 55

Weather Forecasts 75
Winter Course for Farmers 68
Winter Course for Women 68
Wood Turning 55
Wood Work 55

Yeast and Breadmaking 64

Zoology 35